Note remarks

: MB 9,6 r 1 : 03.06.91 Test sheet Edition : 3.5.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 939

Injection pump

Pump designation : PE6P12OA32OLS7836 EP type number : 0 412 626 840

Governor

Governor design. : RQV300...950PA797-31

: 0 421 813 922 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M401 LA Engine

1st version kW : 200.0 : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.50...5.60 Prestroke mm

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 12.40...12.60

Del.quantity cm3/: 18.2...18.4

100 s: (17.9...18.7)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm: 5.2...5.8 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed : 1.00...1.50 travel mm

2nd speed 617 rpm

5.00...5.50 travel mm

780 3rd speed rpm :

: 6.10...6.60 travel mm

: 1009 4th speed rpm

: 8.30...8.80 travel mm

: 1092 5th speed rpm

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 600 Speed Aneroid pressure h: 850 Del.quantity : 182.0...187.0) cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Control Lever position degrees: 118...126 Testing: 1st rack travel in: 12.10 Speed rpm : 990...1000 2nd rack travel in: 4.00 Speed : 1075...1105 rpm 4th rack travel in: 1200 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 82...90 Testing: Speed : 200 rpm Minimum rack trave: 7.30 : 300 rpm Rack travel in mm : 5.20...5.80 CONSTANT REGULATION rpm : 300...450 Speed TORQUE CONTROL Dimension a mm 2nd speed : 950 rpm Rack travel in m: 13.10...13.30 rpm : 800 3rd speed Rack travel in m: 13.10...13.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rom hPa : 800 Pressure Rack travel mm : 12.40...12.50 Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.20...10.40 2nd pressure hPa : 500 Rack travel in m: 11.60...11.80 3rd pressure hPa : 1000

Rack travel in m: 12.60...12.80 4th pressure hPa : 1150 Rack travel in m: 12.90...13.10 5th pressure hPa : -Rack travel in m: 9.50...9.80 START CUT-OUT 1/min: 240 (260) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1400 Speed : 950 rpm Del.quantity cm3/: 203.0...206.0 1000 s: (200.0...209.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1400 Speed rpm : 800 Del.quantity cm3/: 202.0...206.0 1000 s: (199.0...209.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 122.0...124.0 1000 s: (119.0...127.0) cm3 : 8.00Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.10 Speed rpm : 990...1000 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0) Remarks:

Note remarks

: DAF 11.7 L2 : 27.05.91 Edition : 22.3.91 Replaces

: ISO-4113 Test oil

Combination no. : 0 402 646 941

Injection pump

Pump designation : PE6P120A320RS7218Z

: 0 412 626 847 EP type number

Governor

Governor design. : RQ250/1000PA936-1

: 0 421 801 508 Governer no.

Customer-spec. information Customer : DAF

Engine : WS 222 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.30...5.40 Prestroke mm

: (5.25...5.45)

Rack travel in mm : 13.10...14.10

Test sheet

: 0-60-120-180-240-300 Phasing

: 1-5-3-6-2-4

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 13.1...14.1 Difference \* CS : 2.25...3.75

BASIC SETTING

Firing order

rpm: 850 1st speed

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 19.6...19.8

100 s: (19.3...20.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 250.0 2nd speed

Rack travel in mm: 6.6...6.8 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 550 Speed

Rack travel in mm: 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850 Aneroid pressure h: 1000

Del.quantity : 190.0....201.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 15.8

A03

Testing:

1st rack travel in: 12.60

rpm : 1035...1050 Speed

2nd rack travel in: 4.00

rpm : 1125...1155 Speed

4th rack travel in: 1250

rpm : 0.00...2.00Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm : 5.0

Testing:

rpm : 100 Speed

Minimum rack trave: 6.50

Speed rpm: 250
Rack travel in mm: 4.90...5.10
Rack travel in mm: 2.00
Speed rpm: 310...350

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm: 850
Rack travel in m: 14.60...14.70
2nd speed rpm: 990

Rack travel in m: 14.50...14.70

Aneroid/Altitude

Compensator Test

1st version

Setting

: 600 Speed man hPa : 1000 Pressure

Rack travel mm : 13.60...13.70

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 12.30...12.50 2nd pressure hPa : 390 Rack travel in m: 13.30...13.40

3rd pressure hPa : 310

Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 161.0...163.0 1000 s: (158.0...166.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 1035...1050 Speed

LOW IDLE

Speed : 250 rpm

Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

: MB 11,1 d : 27.05.91 Test sheet Edition Replaces : 26.4.91 : ISO-4113 Test oil

Combination no. : 0 402 646 942

Injection pump

Pump designation : PE6P120A320LS7837 : 0 412 626 842

EP type number Governor

Governor design. : R9300/1050PA993 : C 421 801 581 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: 0M441 LA Engine

: 250.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.8

: 1 680 750 075 Test Lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

: 6-3-5-2-4-1 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.70...14.90

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.6...6.2 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

**GUIDE SLEEVE POSITION** Control-lever position

Degree: -2

rpm : 600 Speed Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

: 234.0...236.0 Del.quantity

1000 : (231.0...239.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm Rack travel in mm : 20.0

Testina: 1st rack travel in: 13.90 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 : 1145...1175 Speed man. 4th rack travel in: 1200 rom : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring speed rpm : 300 Rack travel in mm : 5.9 Testina: Speed man Minimum rack trave: 7.70 Speed rpm : 300 Rack travel in mm : 5.60...6.20 Rack travel in mm : 2.00 : 380...420 rom TORQUE CONTROL Dimension a me 2nd speed rpm : 1050 Rack travel in m: 14.90...15.10 3rd speed rpm : 800 Rack travel in m: 15.50...15.70 Aneroid/Altitude Compensator Test 1st version Settina Speed : 600 rom hPa : 1000 Pressure Rack travel mm : 14.70...14.90 Measurement 1/min: 600 Speed 1st pressure hPa : 200 Rack travel in m: 10.00...10.20 2nd pressure hPa : 503
Rack travel in m: 13.50...13.70
3rd pressure hPa : 1250
Rack travel in m: 14.80...15.00 \*
4th pressure hPa : 1400 Rack travel in m: 15.30...15.50 5th pressure hPa : -Rack travel in m: 9.30...9.50 START CUT-OUT 1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1800 Speed rpm : 1050 Del.quantity cm3/ : 235.0...238.0 1000 s: (232.0...241.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1800 Speed rpm : 800 Del.quantity cm3/ : 248.0...252.0 1000 s: (245.0...255.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 135.0...137.0 1000 s: (132.0...140.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than

STARTING FUEL DELIVERY

full load rack tr: 13.90

Speed rpm : 100 bel.quantity cm3/ : 220.0...240.0

1000 s: (216.0...244.0)

rpm : 1090...1105

Remarks:

Speed

\* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

: MB 11,0 t12 Test sheet Edition : 27.05.91

Replaces

Test oil : ISO-4113

Combination no. : 0 402 646 945

Injection pump

Pump designation : PE6P120A320LS7808-2

EP type number : 0 412 626 833

Governor

Governor design. : RQV350...950PA870-11 Governer no. : 0 421 813 928

Customer-spec, information

Customer : MERCEDES-BENZ

: 0M441 LA Engine

: 243.0 1st version kW Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6-3-5-2-4-1

: 0-60-120-180-240-300 Phasing

Tolerance + - \* £ 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.90...14.10

Del.quantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 350.0 2nd speed

Rack travel in mm : 5.1...5.7 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

1.30...1.80 travel mm

2nd speed rpm : 570

: 3.90...4.40 travel mm

: 850 3rd speed rpm

travel mm : 5.70...6.20

: 1008 4th speed rpm

: 7.40...7.90 travel mm

5th speed : 1110 rom

: 9.60...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 985 Speed

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 600 Speed Aneroid pressure h: 900 : 214.0...216.0 Del.quantity 1000 : (211.0...219.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 111...119 Testing: 1st rack travel in: 13.80 : 990...1000 r:pm Speed 2nd rack travel in: 4.00 : 1065...1095 Speed rpm 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 63...71 Testing: Speed : 200 COM Minimum rack trave: 7.30 : 350 rpm Rack travel in mm : 5.10...5.70 CONSTANT REGULATION rpm : 350...600 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 mqn hPa : 900 Pressure : 13.90...14.10 Rack travel mm Measurement Speed 1/min: 600 1st pressure hPa : 300 Rack travel in m: 11.00...11.20 2nd pressure hPa : 550
Rack travel in m: 13.10...13.30
3rd pressure hPa : 1100 Rack travel in m: 14.10...14.30 4th pressure hPa : 1200 Rack travel in m: 14.50...14.70 5th pressure hPa Rack travel in m: 9.50...9.80 START CUT-OUT

Speed 1/min: 270 (290) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1350 : 950 Speed rpm Del.quantity cm3/: 241.0...243.0 1000 s: (238.0...246.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 1350 : 800 Speed rpm Del.quantity cm3/: 237.0...241.0 1000 s: (234.0...244.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 1350 : 950 Speed rpm Del.quantity cm3/: 200.0...202.0 \* 1000 s: (197.0...205.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -: 500 Speed rpm -Del.quantity cm3/: 145.0...147.0 1000 s: (142.0...150.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.80 Speed rpm : 990...1000 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 205.0...225.0 1000 s: (201.0...229.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 14,7 j 2 : 03.06.91 Test sheet Edition Replaces Test oil : ISO-4113 Combination no. : 0 402 648 844A Injection pump Pump designation : PE8P120A320LS7816 EP type number : 0 412 628 829 Governor Governor design. : RQ300/1050PA717-2 : 0 421 801 439 Governer no. Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M442 LA TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 105 assembly Opening 1 : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY

: 5.20...5.30 : (5.15...5.35) Prestroke mm Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-Firing order Phasing : 0-45-90-135-180-225-270-315 Tolerance + - \* : 0.50 (0.75)Time to cyl. no. : 8 BASIC SETTING rpm: 600 1st speed Rack travel in mm : 13.10...13.30 Del.quantity cm3/: 22.9...23.2 100 s: (22.6...23.5) Spread cm3 : 0.4100 s: (0.7) rpm : 300.02nd speed Rack travel in mm: 5.9...6.5 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.5 Spread 100 s: (0.8) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 800 Del.quantity : 229.0...232.0 1000 : (226.0...235.0) Spread cm3 : 4.00 1000 : (7.00) RATED SPEED 1st version Setting point: : 600 Speed rpm Rack travel in mm: 20.0

Testina:

Test pressure, bar: 25...27

1st rack travel in: 12.90 rpm : 1095...1110 Speed 2nd rack travel in: 4.00 : 1145...1175 Speed rpm 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rom Rack travel in mm: 6.2 Testing: Speed rpm : 200 Minimum rack trave: 7.80 Speed rpm: 300
Rack travel in mm: 5.90...6.50
Rack travel in mm: 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a mm : 0.40 2nd speed rpm : 1050 Rack travel in m: 13.90...14.60 3rd speed rpm: 850 Rack travel in m: 14.50...14.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 man. hPa : 800 Pressure : 13.10...13.30 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 11.30...11.50 2nd pressure hPa : 550
Rack travel in m: 12.40...12.60
3rd pressure hPa : 950 Rack travel in m: 13.30...13.50 4th pressure hPa : 1250 Rack travel in m: 13.10...14.30 5th pressure hPa : -Rack travel in m: 10.20...10.50 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1600

Speed man : 1050 Del.quantity cm3/: 241.0...245.0 1000 s: (238.0...248.0) cm3 : 7.00Spread 1000 s: (10.0) Aneroid pressure h: 1600 Speed rpm: 850
Del.quantity cm3/: 254.0...258.0
1000 s: (251.0...261.0) cm3 : 7.00Spread 1000 s: (10.0) Aneroid pressure h: rpm\_ : 500 Speed Del.quantity cm3/: 145.0...147.0 1000 s: (142.0...150.0) Spread cm3: 7.00 1000 s: (10.0) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.90 Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 240.0...260.0

1000 s: (236.0...264.0)

Remarks:

.

A10

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 14,7 j 3 Edition : 03.06.91 Replaces Test oil : ISO-4113 : 0 402 648 844 Combination no. Injection pump Pump designation: PE8P120A320LS7816 EP type number : 0 412 628 829 Governor Governor design. : RQ300/1050PA717-2 : 0 421 801 439 Governer no. Cust. part no. : T3 Customer-spec. information : MERCEDES-BENZ Customer Engine : 0M442 LA TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 : 1 680 750 067 Test lines Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Test pressure, bar: 25...27 Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00 Firing order : 8- 7- 2- 6- 3- 5-Phasing : 0-45-90-135-180-225-270-315 : 0.50 (0.75) Tolerance + - ° Time to cyl. no. :8 BASIC SETTING rpm: 600 1st speed Rack travel in mm : 13.10...13.30 Del.guantity cm3/: 22.5...22.8 100 s: (22.2...23.1) cm3 : 0.4Spread 100 s: (0.7) 2nd speed rpm : 300.0 Rack travel in mm : 5.9...6.5 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.5Spread 100 s: (0.8) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 600 Speed Aneroid pressure h: 800 Del.quantity : 225.0...228.0 1000 : (222.0...231.0) : 4.00 Spread cm3 1000 : (7.00) RATED SPEED 1st version Setting point: rpm : 600 Speed Rack travel in mm : 20.0

per values \_\_\_\_

BEGINNING OF DELIVERY

Testing: 1st rack travel in: 12.90 rpm : 1095...1110 Speed 2nd rack travel in: 4.00 : 1145...1175 Speed rom 4th rack travel in: 1300 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm Rack travel in mm: 6.2 Testing: Speed rpm Minimum rack trave: 7.80 : 300 Speed rpm Rack travel in mm : 5.90...6.50 Rack travel in mm : 2.00 : 380...420 Speed rom TORQUE CONTROL Dimension a mm : 0.40 2nd speed rpm : 1050 Rack travel in m: 13.90...14.60 3rd speed rpm : 850 Rack travel in m: 14.50...14.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 800 Pressure : 13.10...13.30 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : 350 Rack travel in m: 11.30...11.50 2nd pressure hPa : 550
Rack travel in m: 12.40...12.60
3rd pressure hPa : 950 Rack travel in m: 13.30...13.50 4th pressure hPa : 1250 Rack travel in m: 14.10...14.30 5th pressure hPa : -Rack travel in m: 10.20...10.50 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1600 Speed rpm : 1050 Dec.quantity cm3/ : 243.0...247.0 1000 s: (240.0...250.0) cm3 : 7.00Spread 1000 s: (10.0) Aneroid pressure h: 1600 Speed rpm: 850
Del.quantity cm3/: 261.0...265.0
1000 s: (258.0...268.0) cm3 : 7.00 1000 s: (10.0) Spread Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 145.0...147.0 1000 s: (142.0...150.0) cm3 : 7.00 Spread 1000 s: (10.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.90

Speed rpm : 100 Del.quantity cm3/: 240.0...260.0

1000 s: (236.0...264.0)

rpm : 1095...1110

Remarks:

STARTING FUEL DELIVERY

Speed

Note remarks

Test sheet : MB 14,7 k 2 : 03.06.91 Edition

Replaces

: ISO-4113 Test oil

: 0 402 648 845A Combination no.

Injection pump

Pump designation : PE8P12OA32OLS7816 : 0 412 628 829 EP type number

Governor

Governor design. : RQV300...1050PA797-5

: 0 421 813 702 Governer no.

Customer—spec. information

: MERCEDES-BENZ Customer

: 0M442 LA Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina |

: 207...210 pressure, bar

Orifice plate

: 0,8 diameter mm

: 1 680 750 075 Test lines

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35) Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.10...13.30

Del.quantity cm3/: 22.9...23.2

100 s: (22.6...23.5)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 300.0 2nd speed

Rack travel in mm: 5.9...6.5 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.5

Spread

100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 1.20...1.40 travel mm

2nd speed : 800 rom

5.80...6.10 travel mm

: 1120 3rd speed rpm

: 8.20...8.80 travel mm

: 1180 4th speed rpm

: 9.60...10.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 800

: 229.0...232.0 Del.quantity 5th pressure hPa : -1000 : (226.0...235.0) Rack travel in m: 10.20...10.50 : 4.00 Spread cm3 : (7.00) START CUT-OUT 1000 1/min: 220 (240) RATED SPEED Speed 1st version FUEL DELIVERY CHARACTERISTICS Control Lever position degrees: 117...125 1st version Aneroid pressure h: 1600 Testing: rpm : 1050 1st rack travel in: 12.90 Speed Del.quantity cm3/: 241.0...245.0 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 1000 s: (238.0...248.0) rpm : 1155...1185 Spread cm3 : 7.00 Speed 4th rack travel in: 1300 1000 s: (10.0) rpm : 0.00...1.00 Aneroid pressure h: 1600 Speed Speed : 800 rpm Del.quantity cm3/: 254.0...258.0 1000 s: (251.0...261.0) Spread cm3 : 7.00 LOW IDLE 1 Control lever position degrees: 82...90 1000 s: (10.0) Aneroid pressure h: -Testing: Speed : 200 Speed : 500 rpm rpm Del.quantity cm3/: 145.0...147.0 Minimum rack trave: 8.00 Speed rpm : 300 Rack travel in mm : 5.90...6.50 1000 s: (142.0...150.0) cm3 : 7.00Spread 1000 s: (10.0) CONSTANT REGULATION rpm : 300...500 Speed BREAKAWAY TORQUE CONTROL mm : 1.30 rpm : 1050 Dimension a mm 1st version 1mm rack travel less than 2nd speed Rack travel in m: 13.90...14.10 : 800 full load rack tr: 12.90 3rd speed rpm Rack travel in m: 14.50...14.80 rpm : 1090...1100 Speed Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test : 100 Speed rpm Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0) 1st version Setting : 600 Speed rpm Pressure hPa : 800 Remarks: Rack travel mm : 13.10...13.30 Measurement Speed  $1/\min: 600$ 1st pressure hPa : 350 Rack travel in m: 11.30...11.50
2nd pressure hPa : 550
Rack travel in m: 12.40...12.60
3rd pressure hPa : 950 Rack travel in m: 13.30...13.50 4th pressure hPa : 1200 Rack travel in m: 14.10...14.30

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 25...27 Note remarks Prestroke mm Rack travel in mm : 20.00...21.00 Test sheet : MB 14,7 k 3 : 03.06.91 Firing order Edition Replaces : ISO-4113 Test oil Combination no. : 0 402 648 845A3 Phasing Injection pump Pump designation : PE8P12OA32OLS7816 Tolerance + - ° EP type number : 0 412 628 829 Governor Governor design. : RQV300...1050PA797-5 Governor no. : 0 421 813 702 BASIC SETTING Cust. part no. : T3 1st speed Customer—spec. information Customer : MERCEDES-BENZ Engine : 0M442 LA TEST BENCH REQUIREMENTS Spread Test oil inlet temp. °C : 38...42 Overflow valve 2nd speed : 1 417 413 025 Inlet press., bar: 1.50 **Overflow** quantity min. 1/h: 100...120 Test nozzle holder with governor : 1 688 901 019 assembly Opening 1st speed pressure, bar : 207...210 travel mm 2nd speed Orifice plate travel mm diameter mm : 0,8 3rd speed travel mm 4th speed Test lines : 1 680 750 067 travel mm Outside diameter x Wall thickness : 6.00X1.50X1000 x Length mm Speed (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 0-45-90-135-180-225-270-315 : 0.50 (0.75) Time to cyl. no. : 8 rpm: 600 Rack travel in mm : 13.10...13.30 Del.quantity cm3/: 22.5...22.8 100 s: (22.2...23.1) cm3 : 0.4100 s: (0.7) rpm : 300.0 Rack travel in mm: 5.9...6.5 Del.quantity cm3/: 1.6..2.2 100 s: (1.3...2.5) Spread cm3 : 0.5 100 s: (0.8) (B) Setting of injection pump GUIDE SLEEVE TRAVEL rpm : 300: 1.20...1.40 rpm : 800 : 5.80...6.10 rpm : 1120 : 8.20...8.80 rpm : 1180 : 9.60...10.40 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1100 Rack travel in mm: 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600

: 5.20...5.30 : (5.15...5.35)

: 8-7-2-6-3-5-

BEGINNING OF DELIVERY

Aneroid pressure h: 800 Del.quantity : 223.0...231.0) cm3 : 4.00 Spread 1000 : (7.00) RATED SPEED Speed 1st version Control lever position degrees: 117...125 Testina: 1st rack travel in: 12.90 Speed rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1155...1185 4th rack travel in: 1300 Speed rom : 0.00...1.00LOW IDLE 1 Control lever position degrees: 82...90 Spread Testing: Speed : 200 rpm Minimum rack trave: 8.00 rpm : 300 Rack travel in mm : 5.90...6.50 Spread CONSTANT REGULATION rpm : 300...500 Speed TORQUE CONTROL mension a mm : 1.30 nd speed rpm : 1050 Rack travel in m: 13.90...14.10 Dimension a mm 2nd speed rpm rpm : 800 3rd speed Rack travel in m: 14.50...14.80 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rom hPa : 800 Pressure : 13.10...13.30 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 11.30...11.50 2nd pressure hPa : 550 Rack travel in m: 12.40...12.60 3rd pressure hPa : 950 Rack travel in m: 13.30...13.50

Rack travel in m: 14.10...14.30 5th pressure hPa : -Rack travel in m: 10.20...10.50 START CUT-OUT 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1600 rpm : 1050 Del.quantity cm3/: 243.0...247.0 1000 s: (240.0...250.0) Spread cm3 : 7.00 1000 s: (10.0) Aneroid pressure h: 1600 Speed rpm: 800 Del.quantity cm3/: 261.0...265.0 1000 s: (258.0...268.0) cm3 : 7.00 1000 s: (10.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 145.0...147.0 1000 s: (142.0...150.0) cm3 : 7.00 1000 s: (10.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.90 rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 240.0...260.0 1000 s: (236.0...264.0) Remarks:

4th pressure hPa : 1200

Note remarks

: MB 14,7 i 1 : 27.05.91 Test sheet Edition Replaces : 26.4.91 Test oil : ISO-4113

Combination no. : 0 402 648 846

Injection pump

Pump designation : PE8P120A320LS7815 : 0 412 628 827 EP type number

Governor

Governor design. : RQV350...1050PA870-3

: 0 421 813 700 Governer no.

Customer-spec, information

Customer : DAIMLER-BENZ

Engine : 0M442LA

: 368.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

**Openina** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-Firing order

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 15.10...15.20

Del.quantity cm3/: 25.8...26.0

100 s: (25.5...26.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.0...5.6 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.90...2.10 travel mm

rpm : 700 2nd speed

: 4.10...4.50 travel mm

rpm : 1100 3rd speed

: 7.60...8.00 travel mm

: 1200 4th speed rpm

: 9.50...9.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1150

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Rack travel in m: 13.00...13.20 Speed rpm : 10503rd pressure hPa : 1260 Aneroid pressure h: 1500 : 258.0...260.0 1000 : (255.0...263.0) Rack travel in m: 14.60...14.80 Del.quantity 4th pressure hPa : 1400 : 5.00 Rack travel in m: 15.00...15.20 cm3 Spread 1000 : (9.00) 5th pressure hPa : -Rack travel in m: 8.80...9.10 RATED SPEED START CUT-OUT 1st version Control lever 1/min: 270 (290) Speed position degrees: 114...122 FUEL DELIVERY CHARACTERISTICS Testing: 1st rack travel in: 14.10 Speed rpm: 1090...1100 2nd rack travel in: 4.00 1st version Aneroid pressure h: 1000 rpm : 1190...1220 : 600 Speed Speed rpm 4th rack travel in: 1300 Del.quantity cm3/: 239.0...242.0 1000 s: (236.0...245.0) Speed rpm : 0.00...1.00cm3 : 8.00Spread 1000 s: (12.0) LOW IDLE 1 Aneroid pressure h: 1500 Control lever : 800 position degrees: 62...70 Speed rom Del.quantity cm3/: 266.0...270.0 1000 s: (263.0...273.0) Testing: : 200 : 8.00 Speed Spread cm3 rpm 1000 s: (12.0) Minimum rack trave: 7.60 Aneroid pressure h: 1500 : 350 rpm rpm : 1050 Rack travel in mm : 5.00...5.60 Speed Del.quantity cm3/: 194.0...196.0 \* 1000 s: (191.0...199.0) CONSTANT REGULATION cm3 : 8.00 rpm : 350...600 Speed Spread 1000 s: (12.0) TORQUE CONTROL Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 144.0...146.0 1000 s: (141.0...149.0) Dimension a mm : 0.30 Torque control curve - 1st version : 1050 1st speed rpm cm3 : 8.00Rack travel in m: 15.10...15.20 Spread rpm : 1000 1000 s: (-) 2nd speed Rack travel in m: 15.30...15.50 3rd speed rpm : 800 Rack travel in m: 15.40...15.60 **BREAKAWAY** Aneroid/Altitude 1st version 1mm rack travel less than Compensator Test full load rack tr: 14.10 rpm : 1090...1100 1st version Speed Setting : 600 Speed STARTING FUEL DELIVERY rom hPa : 1000 Pressure : 14.40...14.60 Rack travel mm Speed rpm : 100 Del.quantity cm3/ : 260.0...280.0 1000 s: (256.0...284.0) Measurement 1/min: 600 Speed Remarks: 1st pressure hPa : 330 Rack travel in m: 10.10...10.30 2nd pressure hPa : 600

\* = Set at reduced-delivery stop.

: 4.50...4.60 : (4.45...4.65) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks Firing order : 8- 7- 2- 6- 3- 5-Test sheet : MAN 14,5 e Edition : 27.05.91 Replaces : 2.1.90 Test oil : ISO-4113 : 0-45-90-135-180-225-270-315 Phasing Combination no. : 0 402 648 851 : 0.50 (0.75) Tolerance + - ° Injection pump Pump designation : PE8P12OA520LS7818 Time to cyl. no. : 8 : 0 412 628 830 EP type number BASIC SETTING Governor Governor design. : RQV250...1150PA902 : 0 421 813 720 rpm: 1150 Governer no. 1st speed Customer-spec. information Rack travel in mm : 13.80...13.90 Customer : MAN Del.quantity cm3/: 30.7...30.9 Engine : D2848LXE 40 100 s: (30.4...31.2) 1st version kW : 500.0 : 2300 Rated speed Spread cm3 : 0.5TEST BENCH REQUIREMENTS 100 s: (0.9) Test oil 2nd speed rpm : 500 Rack travel in mm : 8.90...9.10 inlet temp. °C : 38...42 Del.quantity cm3/: 14.9...15.1 100 s: (14.6...15.4) Overflow valve : 1 417 413 025 Spread cm3 : -100 s: (-) Inlet press., bar: 1.50 rpm : 250 3rd speed Rack travel in mm : 7.30...7.50 Del.quantity cm3/: 5.2...6.0 \* 100 s: (-) Test nozzle holder : 1 688 901 019 assembly Opening (B) Setting of injection pump : 207...210 with governor pressure, bar Orifice plate GUIDE SLEEVE TRAVEL rpm : 250 diameter mm : 0,8 1st speed : 1.40...1.60 travel mm rpm : 450 2nd speed : 3.40...4.00 Test lines : 1 680 750 067 travel mm rpm : 850 3rd speed : 6.30...6.90 Outside diameter travel mm x Wall thickness rpm : 1150 4th speed : 6.00x1.50x1000 travel mm : 9.40...9.60 x Length mm : 1450 5th speed rpm (A) Injection pump setting values travel mm : 13.00...14.00 Insp. values in parentheses Set equal delivery quant. GUIDE SLEEVE POSITION per values \_\_\_\_ Control-lever position Degree: -1

rpm : 1240

Rack travel in mm : 15.20...17.80

Speed

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

FULL LOAD DELIV. AT FULL LOAD STOP	+ FUEL DELIVERY CHARACTERISTICS
1st version Speed rpm : 1150 Aneroid pressure h: 1300 Del.quantity : 307.0309.0 1000 : (304.0312.0) Spread cm3 : 5.00 1000 : (9.00)	1st version Aneroid pressure h: - Speed rpm: 500 Del.quantity cm3/: 149.0151.0 1000 s: (146.0154.0)
RATED SPEED	T BREAKAWAY
1st version Control lever position degrees: 118126	1st version 1mm rack travel less than
Testing:	+ full load rack tr: 12.80 + Speed rpm : 11901200
1st rack travel in: 12.80 Speed rpm : 11901200 2nd rack travel in: 4.00 Speed rpm : 12951325	STARTING FUEL DELIVERY
4th rack travel in: 1450 Speed rpm : 0.001.00	Speed rpm : 100 
LOW IDLE 1 Control lever position degrees: 8088	- Speed rpm : 100 - Del.quantity cm3/: 0 ** - 1000 s: (-)
Testing: Speed rpm: 100 Minimum rack trave: 8.90 Speed rpm: 250 Rack travel in mm: 7.307.50 Rack travel in mm: 2.00 Speed rpm: 430490	HIGH IDLE  1st version Speed rpm: 500 Rack travel in mm: < 7.00 Del.quantity cm3/: 0 ** 1000 s: (-)
Aneroid/Altitwde Compensator Test	+ 2nd version + Speed rpm : 500
1st version Setting Speed rpm : 500	Rack travel in mm : < 7.50  Del.quantity cm3/ : < 50.0 **  1000 s: (-)
Speed rpm: 500 Pressure hPa: 1300 Rack travel mm: 13.8013.90	3rd version Speed rpm : 500 Rack travel in mm : 8.308.50
Measurement Speed 1/min: 500	Del.quantity cm3/: 125.0** 1000 s: (-)
1st pressure hPa : - Rack travel in m: 8.909.10 2nd pressure hPa : 100 Rack travel in m: 9.309.40 3rd pressure hPa : 470 Rack travel in m: 12.3012.60	LOW IDLE  Speed rpm : 250 Rack travel in mm : 7.307.50 Del.quantity cm3/ : 52.060.0 1000 s: (-)
START CUT-OUT	Remarks: : MAN-NR. 2-7944
Speed 1/min: 200 (220)	* applies to cylinders 2, 3, 4 and 8

\*\* applies for cylinders 1, 5, 6, and 7
APPLICATION
Ship

Note remarks

Test sheet : SCA 14,0 h7 : 27.05.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 402 648 869

Injection pump

Pump designation : PE8P12OA92O/4LS7125

EP type number : 0 412 628 833

Governor

Governor design. : RQV200...1050PA736-7

: 0 421 813 771 Governer no.

Customer-spec. information Customer : SCANIA

Engine : DS14

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina (

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm: 13.50...13.60

Del.quantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 225.0 Rack travel in mm : 5.0...5.6 Del.quantity cm3/ : 1.6...2.0

100 s: (-)

Spread cm3 : 0.3100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225 : 1.20...1.60 travel mm

: 350 2nd speed rpm

: 2.30...2.90 travel mm

3rd speed : 650 rpm travel mm 4.00...4.60

1095 4th speed rpm

8.20...8.40 travel mm

: 1215 5th speed rpm

: 9.70...10.10 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

Del.quantity : 214.0...219.0)

cm3 : 6.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 95...103

Testina:

1st rack travel in: 12.50 Speed rpm : 1090...1100

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1350

Speed rom : 0.00...1.00

LOW IDLE 1 Control Lever

position degrees: 40...48

Testing:

Speed : 100 rpm Minimum rack trave: 6.50

: 225 Speed rpm

Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00

: 380...440 Speed rpm

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom hPa : 900 Pressure

: 13.50...13.60 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 11.20...11.60

2nd pressure hPa : 365 Rack travel in m: 12.80...12.90

3rd pressure hPa : 215

Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1050 Del.quantity cm3/ : 208.0...216.0 1000 s: (206.0...218.0)

Aneroid pressure h: -

: 500 Speed rom

Del.quantity cm3/: 158.0...162.0 1000 s: (156.0...164.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.50 Speed rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm

Del.quantity cm3/: 240.0...290.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225

Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO diaphragm.

For comb. with letter index see VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania on November 29, 1990

Start of delivery - engine: 16° before

Engine firing sequence: 1-5-4-2-6-3-7-8

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 25...27 Note remarks Prestroke mm : 5.00...5.10 : (4.95...5.15) Rack travel in mm : 20.00...21.00 Test sheet : MB 14,7 v 2 : 27.05.91 Edition : 8-7-2-6-3-5-: 26.4.91 Replaces Firing order : ISO-4113 Test oil : 0 402 648 899 Combination no. : 0-45-90-135-180-225-Phasing Injection pump Pump designation : PE8P120A320LS7839 270-315 Tolerance + - ° : 0.50 (0.75) EP type number : 0 412 628 849 Governor Governor design: RQ300/950PA971-5 Time to cyl. no. : 8 : 0 421 801 559 Governer no. BASIC SETTING Customer-spec. information : MERCEDES-BENZ 1st speed rpm: 600 Customer Rack travel in mm : 15.10...15.30 : 0M442 LA Engine : 370.0 Del.quantity cm3/: 25.6...25.8 1st version kW : 1900 Rated speed 100 s: (25.3...26.1) TEST BENCH REQUIREMENTS Spread cm3 : 0.6Test oil inlet temp. °C : 38...42 100 s: (0.9) rpm : 300.0Overflow valve 2nd speed Rack travel in mm : 5.2...5.8 Del.quantity cm3/ : 1.6...2.2 : 1 417 413 025 100 s: (1.3...2.5) cm3 : 0.6 Inlet press., bar: 1.50 Spread 100 s: (1.0) Overflow quantity min. 1/h: 100...120 GUIDE SLEEVE POSITION Test nozzle holder Control-lever position : 1 688 901 105 assembly Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 Opening 1 : 207...210 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate diameter mm 1st version : 0,8 rpm : 600 Speed Aneroid pressure h: 1050 : 1 680 750 075 : 256.0...258.0 Test Lines Del.quantity 1000 : (253.0...261.0) : 6.00 Outside diameter Spread cm3 1000 : (9.00) x Wall thickness : 8.00x2.50x1000 x Length mm

RATED SPEED

Setting point:

rpm

: 600

Speed

(A) Injection pump setting values
Insp. values in parentheses + 1st version

Set equal delivery quant. per values \_\_\_\_\_

A25

Rack travel in mm: 20.0 Testing: 1st rack travel in: 15.20 rpm : 990...1005 Speed 2nd rack travel in: 4.00 Speed rpm : 1075...1105 4th rack travel in: 1150 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.5 Testing: Speed rpm : 200 Minimum rack trave: 6.80 Speed : 300 rpm Rack travel in mm : 5.20...5.80 Rack travel in mm : 2.00 Speed rpm : 370...410 TORQUE CONTROL Dimension a mm : 950 2nd speed rpm Rack travel in m: 16.20...16.40 3rd speed rpm : 800 Rack travel in m: 16.20...16.40 Aneroid/Altitude Compensator Test 1st version Settina Speed : 600 rpm hPa : 1050 Pressure Rack travel mm : 15.10...15.30 Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 10.20...10.40 2nd pressure hPa : 800 Rack travel in m: 13.90...14.10 3rd pressure hPa : 1300 Rack travel in m: 15.30...15.50 4th pressure hPa : 1600 Rack travel in m: 15.90...16.10 5th pressure hPa : Rack travel in m: 9.40...9.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1900 Speed : 950 rom

Del.quantity cm3/: 279.0...282.0 1000 s: (276.0...285.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) Spread cm3 : 8.00 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 15.20 Speed rpm : 990...1005

:

Remarks:

A26

Note remarks

: MB 14,7 v : 27.05.91 Test sheet Edition : 24.4.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 648 902

Injection pump

Pump designation : PE8P120A320LS7839 : 0 412 628 849 EP type number

Governor

Governor design. : RQ300/1050PA972-5 : 0 421 801 564 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

Engine : 0M442 LA

: 370.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening 1

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_

Spread

1st version

Speed : 600 rpm

RATED SPEED

rpm: 600

270-315

: 0.50 (0.75)

: 5.00...5.10

: (4.95...5.15)

: 8-7-2-6-3-4-1

: 0-45-90-135-180-225-

Rack travel in mm : 15.10...15.30

Del.quantity cm3/: 25.6...25.8

100 s: (25.3...26.1)

cm3 : 0.6Spread

BEGINNING OF DELIVERY

Prestroke mm

Firing order

Tolerance + - °

BASIC SETTING

1st speed

Time to cyl. no. : 8

Phasing

Test pressure, bar: 25...27

Rack travel in mm : 20.00...21.00

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 6.2...6.8 Del.quantity cm3/: 1.6...2.2 100 s: (1,3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1050

: 256.0...258.0 Del.quantity 1000 : (253.0...261.0)

cm3 : 6.00 1000 : (9.00)

Rack travel in mm: 20.0 Testing: 1st rack travel in: 14.50 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1250 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring : 300 rpm Rack travel in mm: 6.5 Testing: Speed : 200 rpm Minimum rack trave: 7.80 : 300 Speed rpm Rack travel in mm : 6.20...6.80 Rack travel in mm : 2.00 : 380...420 Speed rpm TORQUE CONTROL Dimension a mm : 1050 2nd speed rpm Rack travel in m: 15.50...15.70 3rd speed rpm : 800 Rack travel in m: 15.70...15.90 Aneroid/Altitude Compensator Test 1st version Setting : 100 Speed rpm hPa : 1050 Pressure : 14.60...14.80 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 9.70...9.90 2nd pressure hPa : 800 Rack travel in m: 13.40...13.60 3rd pressure hPa : 1300 Rack travel in m: 14.80...15.00 4th pressure hPa : 1600 Rack travel in m: 15.40...15.60 5th pressure hPa : -Rack travel in m: 8.90...9.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1900 Speed : 1050 rpm

Del.quantity cm3/: 271.0...274.0 1000 s: (268.0...277.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1900 Speed rpm : 800 Del.quantity cm3/: 276.0...280.0 1000 s: (273.0...283.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -: 500 Speed rpm Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) cm3 : 8.00Spread 1000 s: (12.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 14.50 Speed rpm : 1090...1105

Remarks:

:

Note remarks

Test sheet : MB 14,7 v 1 : 27.05.91 Edition Replaces : 26.4.91 : ISO-4113 Test oil

Combination no. : 0 402 648 907

Injection pump

Pump designation : PE8P120A320LS7839 EP type number : 0 412 628 849

Governor

Governor design. : RQV300...950PA797-22

: 0 421 813 909 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

: 0M442 LA Engine

: 370.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

**Overflow** 

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15) Rack travel in mm : 20.00...21.00

: 8- 7- 2- 6- 3- 5-Firing order

: 0-45-90-135-180-225-Phasina

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 15.10...15.30

Del.quantity cm3/: 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 5.2...5.8
Del.quantity cm3/ : 1.6...2.2
100 s: (1.3...2.5)

Spread cm3 : 0.6 100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300 : 1.00...1.50 travel mm

rpm : 617 2nd speed

: 5.00...5.50 travel mm

rpm : 780 3rd speed

: 6.10...6.60 travel mm

rpm : 1010 4th speed

: 8.30...8.80 travel mm

: 1092 5th speed rpm

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 600 Speed Aneroid pressure h: 1050 Aneroid p. ... Del.quantity 1000 : 256.0...258.0 : (253.0...261.0) : 6.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 118...126 Testina: 1st rack travel in: 15.20 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1080...1110 Speed 4th rack travel in: 1150 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 82...90 Testing: Speed : 200 rom Minimum rack trave: 6.80 : 300 rpm Rack travel in mm : 5.20...5.80 CONSTANT REGULATION rpm : 300...500 Speed TORQUE CONTROL Dimension a mm : 950 2nd speed rpm Rack travel in m: 16.20...16.40 3rd speed rpm : 800 Rack travel in m: 16.20...16.40 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rom Pressure hPa : 1050 : 15.10...15.30 Rack travel mm Measurement Speed 1/min: 600 1st pressure hPa : 350 Rack travel in m: 10.20...10.40 2nd pressure hPa : 800 Rack travel in m: 13.90...14.10

3rd pressure hPa : 1300 Rack travel in m: 15.30...15.50 4th pressure hPa : 1600 Rack travel in m: 15.90...16.10 5th pressure hPa : -Rack travel in m: 9.40...9.70 START CUT-OUT 1/min: 240 (260) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1900 Speed rpm : 950 Del.quantity cm3/: 279.0...282.0 1000 s: (276.0...285.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1900 : 800 Speed rpm **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 15.20 rpm : 990...1000 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 275.0...295.0 1000 s: (271.0...299.0)

:

Remarks:

B02

## Note remarks

: MB 14,7 v 3 : 03.06.91 Test sheet Edition : 28.3.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 648 911

Injection pump

Pump designation : PE8P120A320LS7839 EP type number : 0 412 628 849

Governor

: RQV300...1050PA797-Governor design.

Governer no. : 0 421 813 916

Customer—spec. information

: MERCEDES-BENZ Customer

Engine : 0M442 LA

: 370.0 1st version kW : 2100 Rated speed

## TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

: 0,8 diameter mm

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10 : (4.95...5.15)

Rack travel in mm : 20.00...21.00 : 8-7-2-6-3-5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 8

## BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 5.2...5.8

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.6 Spread

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.00...1.50 travel mm 558 2nd speed rpm

: 4.30...4.80

travel mm

3rd speed 820 rpm

5.90...6.40 travel mm

4th speed 1108 rpm

travel mm : 8.30...8.80

5th speed : 1183 rpm

: 8.30...8.80 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130 Speed

Rack travel in mm : 15.20...17.80

Rack travel in m: 13.40...13.60 3rd pressure hPa : 1300 Rack travel in m: 14.80...15.00 4th pressure hPa : 1600 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 600 Speed Rack travel in m: 15.40...15.60 Aneroid pressure h: 1050 Del.quantity : 250.0...261.0) 5th pressure hPa : -Rack travel in m: 8.90...9.20 : 6.00 cm3 Spread 1000 : (9.00) START CUT-OUT 1/min : 220 (240) RATED SPEED Speed FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 118...126 1st version Aneroid pressure h: 1900 Testina: Speed rpm : 1050 Del.quantity cm3/ : 271.0...274.0 1000 s: (268.0...277.0) 1st rack travel in: 14.10 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 cm3 : 8.00 rpm : 1175...1205 Spread Speed 4th rack travel in: 1250 1000 s: (12.0) Aneroid pressure h: 1900 Speed rpm : 0.00...1.00: 800 Speed rpm Del.quantity cm3/: 276.0...280.0 1000 s: (273.0...283.0) LOW IDLE 1 Control lever cm3 : 8.00 1000 s: (12.0) position degrees: 76...84 Spread Aneroid pressure h: -Testina: Speed : 200 Speed rpm : 500 rom Del.quantity cm3/: 136.0...138.0 Minimum rack trave: 6.80 1000 s: (133.0...141.0) Speed rpm: 300 Rack travel in mm: 5.20...5.80 Spread cm3 : 8.001000 s: (12.0) CONSTANT REGULATION rpm : 300...450 Speed **BREAKAWAY** TORQUE CONTROL Dimension a mm : 0.80 1st version 2nd speed rpm : 1050 1mm rack travel less than Rack travel in m: 15.10...15.30 : 800 3rd speed rpm : 800 Rack travel in m: 15.90...16.10 full load rack tr: 14.10 rpm : 1090...1100 Speed Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test rpm : 100 Del.quantity cm3/: 275.0...295.0 1000 s: (260.0...280.0) 1st version Setting : 600 Speed rom hPa : 1050 Remarks: Pressure : 14.60...14.80 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : 350 Rack travel in m: 9.70...9.90 2nd pressure hPa : 800

B04

Note remarks

: FIA 17.2 f : 03.06.91 Test sheet Edition

Replaces Test oil : ISO-4113

: 0 402 648 912 Combination no.

Injection pump

Pump designation : PE8P130A920/5LS7841

: 0 412 638 803 EP type number

Governor

Governor design. : RQV300...950PA994K

: 0 421 815 275 Governer no.

Customer-spec. information

: IVECO-FIAT Customer

: 8280.42.050 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 688 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

: 1- 8- 4- 3- 6- 5-7- 2 Firing order

: 0-45-90-135-180-225-Phasina

270-315

: 0.50 (0.75) Tolerance + - \*

Time to cyl. no. : 1

BASIC SETTING

rpm: 950 1st speed

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 22.3...22.6

100 s: (21.9...22.9)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 250.0

Rack travel in mm : 6.3...6.7 Del.quantity cm3/ : 2.0...2.6

100 s: (1.6...3.0) cm3 : 1.0Spread

100 s: (1.4)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed

: 10.20...10.40 travel mm

: 300 2nd speed rpm

: 2.00...2.30 travel mm

3rd speed : 700 rpm travel mm 5.80...6.20

1200 4th speed rpm

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1100 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 950 Speed

Aneroid pressure h: 900

: 223.0...226.0 Del.quantity 1000 : (219.5...229.5)

: 6.00 Spread cm3

1000 : (10.00)

**B05** 

RATED SPEED

1st version Control lever

position degrees: 111...119

Testing:

1st rack travel in: 12.70 Speed rpm: 990...1000

2nd rack travel in: 4.00

rpm : 1075...1105 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 61...69

Testina:

Speed rpm : 200 Minimum rack trave: 7.50

rpm : 300 Speed

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 310...440 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 950

Rack travel in m: 13.70...13.80

2nd speed rpm : 800

Rack travel in m: 13.70...13.90

3rd speed rpm : 700

Rack travel in m: 13.40...13.60

4th speed rpm : 500 Rack travel in m: 13.10...13.30

Aneroid/Altitude

Compensator Test

1st version

Settina

: 950 Speed man

hPa : 900 Pressure

: 13.70...13.80 Rack travel mm

Measurement

1/min: 950 Speed

1st pressure hPa : -

Rack travel in m: 10.40...10.60

2nd pressure hPa : 380
Rack travel in m: 12.90...13.00
3rd pressure hPa : 260
Rack travel in m: 11.10...11.50

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 500 Del.quantity cm3/ : 227.0...234.0 1000 s: (223.5...237.5)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 144.0...147.0

1000 s: (140.5...150.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 12.70

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 220.0...250.0 1000 s: (216.0...254.0)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: MAN 14,5 e1 Test sheet : 27.05.91 Edition Replaces : 28.3.91 : ISO-4113 Test oil

: 0 402 648 916 Combination no.

Injection pump

Pump designation: PE8P120A520LS7818-1 EP type number : 0 412 628 857

Governor

Governor design. : RQV250...1150PA902

: 0 421 813 720 Governer no.

Customer-spec. information : MAN Customer

: D2848LXE 40 Engine

1st version kW : 500.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

**Opening** 

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.50...4.60 : (4.45...4.65) Prestroke mm

Rack travel in mm: 9.00...12.00 Firing order: 8-7-2-6-3-5-4-1

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 13.80...13.90

Del.quantity cm3/: 30.7...30.9

100 s: (30.4...31.2)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 500 2nd speed

Rack travel in mm : 8.90...9.10 Del.quantity cm3/: 14.9...15.1

100 s: (14.6...15.4)

cm3 : -0 Spread

100 s: (-)
3rd speed rpm : 250
Rack travel in mm : 7.30...7.50

Del.quantity cm3/: 5.2...6.0 \* 100 s: (-)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed : 1.40...1.60 travel mm

rpm : 450 2nd speed

: 3.40...4.00 travel mm : 850 3rd speed rom

: 6.30...6.90 travel mm

: 1150 4th speed rpm : 9.40...9.60

travel mm : 1450 5th speed rpm

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1210

Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1150 1st version Speed Aneroid pressure h: 1300 Aneroid pressure h: rpm : 500 Del.quantity : 307.0...309.0 Speed Del.quantity cm3/: 149.0...151.0 1000 : (304.0...312.0) : 5.00 cm3 1000 s: (146.0...154.0) Spread 1000 : (9.00) RATED SPEED **BREAKAWAY** 1st version 1st version Control lever 1mm rack travel less than position degrees: 118...126 full load rack tr: 12.80 rpm : 1190...1200 Testina: Speed 1st rack travel in: 12.80 rpm : 1190...1200 STARTING FUEL DELIVERY Speed 2nd rack travel in: 4.00 rpm : 1295...1325 Speed Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 \* 1000 s: (-) 4th rack travel in: 1450 Speed rom : 0.00...1.00LOW IDLE 1 rpm : 100 Control lever Speed Del.quantity cm3/: 0 \*\* position degrees: 80...88 1000 s: (-) Testing: rpm : 100 Speed HIGH IDLE Minimum rack trave: 8.90 Speed rpm : 250 Rack travel in mm : 7.30...7.50 1st version Speed rpm Rack travel in mm : 2.00 Rack travel in mm: < 7.00 : 430...490 Del.quantity cm3/: 0 \*\* Speed rom 1000 s: (-) Aneroid/Altitude 2nd version Compensator Test Speed rpm : 500 Rack travel in mm : < 7.50 Del.quantity cm3/ : < 50.0 \*\* 1000 s: (-) 1st version Setting : 500 Speed rpm hPa : 1300 Pressure 3rd version rpm : 500 Rack travel mm : 13.80...13.90 Speed Rack travel in mm : 7.30...7.50 Del.quantity cm3/: 125.0... \*\* 1000 s: (-) Measurement 1/min: 500 Speed 1st pressure hPa : -LOW IDLE Rack travel in m: 8.90...9.10 Speed rpm : 250
Rack travel in mm : 7.30...7.50
Del.quantity cm3/ : 52.0...60.0 \* 2nd pressure hPa : 100 Rack travel in m: 9.30...9.40 3rd pressure hPa : 470 Rack travel in m: 12.30...12.60 1000 s: (-) START CUT-OUT Remarks: : MAN-NR. 2-7944 1/min : 200 (220) Speed \* applies to cylinders 2, 3, 4 and 8 \*\* applies for cylinders 1, 5, 6, and 7 APPLICATION Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 14,7 v 4 Edition : 03.06.91 Replaces Test oil : ISO-4113 : 0 402 648 917 Combination no. Injection pump EP type number : 0 412 628 849 Governor Governor design. Governer no. : 0 421 801 601 Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M442 LA : 370.0 1st version kW Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 105 assembly Openina : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter

Pump designation : PE8P120A320LS7839 : RQ300/1050PA993-3 x Wall thickness : 8.00x2.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_ B10

BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 5.00...5.10 Prestroke mm : (4.95...5.15) Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-Firing order : 0-45-90-135-180-225-Phasing 270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rpm: 600 Rack travel in mm : 15.10...15.30 Del.quantity cm3/: 25.6...25.8 100 s: (25,3,...26,1) cm3 : 0.6Spread 100 s: (0.9) rpm : 300.02nd speed Rack travel in mm: 6.2...6.8 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) Spread cm3 : 0.6 100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 1050 : 2<u>56.</u>0...258.0 Del.quantity 1000 : (253.0...261.0) : 6.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Setting point:

: 600

man

Speed

Rack travel in mm: 20.0 1st version Aneroid pressure h: 1900 Testing: : 1050 1st rack travel in: 14.50 Speed rpm Del.guantity cm3/: 271.0...274.0 rpm : 1090...1105 Speed 1000 s: (268.0...277.0) 2nd rack travel in: 4.00 rpm : 1160...1190 Speed Spread cm3 : 8.004th rack travel in: 1250 1000 s: (12.0) rpm : 0.00...1.50Aneroid pressure h: 1900 Speed Speed rpm: 800 Del.quantity cm3/: 276.0...280.0 1000 s: (273.0...283.0) LOW IDLE 1 Setting point w/out bumper spring cm3 : 8.00 rpm : 300 Spread Rack travel in mm: 6.5 1000 s: (12.0) Aneroid pressure h: rpm : 500 Testing: Speed Del.quantity cm3/: 136.0...138.0 : 200 Speed rpm 1000 s: (133.0...141.0) Minimum rack trave: 7.80 : 300 Speed rpm Spread cm3 : 8.00 Rack travel in mm : 6.20...6.80 1000 s: (12.0) Rack travel in mm: 2.00 : 380...420 Speed rpm BREAKAWAY TORQUE CONTROL Dimension a mm 1st version 2nd speed : 1050 1mm rack travel less than rpm Rack travel in m: 15.50...15.70 3rd speed rpm : 800 full load rack tr: 14.50 Rack travel in m: 15.70...15.90 rpm : 1090...1105 Speed Aneroid/Altitude Remarks: Compensator Test 1st version Setting : 600 Speed rom hPa : 1050 Pressure : 14.60...14.80 Rack travel mm Measurement 1/min : 600Speed 1st pressure hPa : 350 Rack travel in m: 9.70...9.90
2nd pressure hPa : 800
Rack travel in m: 13.40...13.60
3rd pressure hPa : 1300
Rack travel in m: 14.80...15.00 4th pressure hPa : 1600 Rack travel in m: 15.40...15.60 5th pressure hPa Rack travel in m: 8.90...9.20 START CUT-OUT 1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 14,7 w 3 : 03.06.91 Edition

Replaces

Test oil : ISO-4113

: 0 402 648 918 Combination no.

Injection pump

Pump designation : PE8P120A320LS7838

: 0 412 628 848 EP type number

Governor

Governor design. : RQ300/1050PA993-4

: 0 421 801 602 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M442 A

: 320.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

: 0-45-90-135-180-225-Phasina

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 600 1st speed

Rack travel in mm : 14.10...14.30

Del.guantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

cm3 : 0.6Spread

100 s: (0.9)

rpm : 300.0 2nd speed

Rack travel in mm : 6.2...6.8 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5) cm3 : 0.6 Spread

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 1020

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 600 Speed Aneroid pressure h: 1000

: 229.0...231.0 Del.quantity

1000 : (226.0...234.0)

: 6.00 cm3 Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 1020 Speed rpm

Rack travel in mm: 20.0 Testing: 1st version 1st rack travel in: 13.50 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1165...1195 Speed 4th rack travel in: 1250 Spread : 0.00...1.50 Speed rpm LOW IDLE 1 Speed Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 6.5 Spread Testing: Speed : 200 Speed rpm Minimum rack trave: 7.80 : 300 rpm Rack travel in mm : 6.20...6.80 Spread CONSTANT REGULATION Speed rpm : 300...500**BREAKAWAY** TORQUE CONTROL Dimension a mm 2nd speed rpm : 1050 Rack travel in m: 14.50...14.70 3rd speed rpm : 800 Rack travel in m: 15.00...15.20 Speed Aneroid/Altitude Remarks: Compensator Test 1st version Setting Speed : 600 rpm hPa : 1000 Pressure : 14.10...14.30 Rack travel mm Measurement  $1/\min: 600$ Speed 1st pressure hPa : 350 Rack travel in m: 10.00...10.20 2nd pressure hPa : 700 Rack travel in m: 13.00...13.20 3rd pressure hPa : 1200 Rack travel in m: 14.30...14.50 4th pressure hPa : 1350 Rack travel in m: 14.70...14.90 5th pressure hPa : Rack travel in m: 9.20...9.40 START CUT-OUT 1/min : 220 (240) Speed

Aneroid pressure h: 1600 Speed rpm : 1050 Del.quantity cm3/ : 226.0...229.0 1000 s: (223.0...232.0) cm3 : 8.001000 s: (12.0) Aneroid pressure h: 1600 : 800 rpm Del.quantity cm3/: 239.0...243.0 1000 s: (236.0...246.0) cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -: 500 rpm Del.quantity cm3/: 138.0...140.0 1000 s: (135.0...143.0) cm3 : 8.00 1000 s: (12.0)

1st version 1mm rack travel less than

full load rack tr: 13.50 rpm : 1090...1105

**B13** 

FUEL DELIVERY CHARACTERISTICS

: 4.50...4.60 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm (4.45...4.65) Rack travel in mm : 9.00...12.00 Firing order : 10- 9- 4- 1- 8- 7-6- 3- 5- 2 Note remarks Test sheet : MAN 18,2 h1 Edition : 27.05.91 Replaces : ISO-4113 Test oil Phasing : 0-45-72-117-144-189-216-261-288-333 : 0.50 (0.75) Combination no. : 0 402 649 813 Tolerance + - ° Injection pump Pump designation : PE10P120A520LS7825-1 Time to cyl. no. : 10 EP type number : 0 412 629 809 Governor BASIC SETTING Governor design. : RQV250...1150PA902-3 : 0 421 813 761 rpm: 1150 Governer no. 1st speed Rack travel in mm : 13.00...13.10 Customer—spec. information Customer : MAN Del.guantity cm3/: 28.4...28.6 Engine : D 2840 LXE 100 s: (28.1...28.9) : 603.0 1st version kW : 2300 cm3 : 0.5Spread Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 500 Rack travel in mm : 8.80...9.00 Del.quantity cm3/: 14.9...15.1 Test oil inlet temp. °C : 38...42 100 s: (14.6...15.4) Overflow valve : 1 417 413 025 cm3 : 0.8 Spread 100 s: (1.2) rpm : 250 3rd speed Inlet press., bar: 1.50 Rack travel in mm: 7.30...7.50 Del.quantity cm3/: 5.2...6.0 \*\* 100 s: (-) Test nozzle holder : 1 688 901 019 assembly cm3 : -Spread 100 s: (-) Opening pressure, bar : 207...210 (B) Setting of injection pump with governor Orifice plate : 0,8 diameter mm GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 0.90...1.10 Test lines : 1 680 750 067 travel mm 2nd speed rpm : 450 : 2.90...3.50 Outside diameter travel mm rpm : 750 x Wall thickness 3rd speed : 5.50...5.90 x Length mm : 6.00x1.50x1000 travel mm 1150 4th speed rpm 9.20...9.40 (A) Injection pump setting values travel mm Insp. values in parentheses 1400 5th speed rpm : 13.00...14.00 Set equal delivery quant. travel mm per values GUIDE SLEEVE POSITION BEGINNING OF DELIVERY Control-lever position

Degree: -1 rpm : 1225

Speed

Test pressure, bar: 25...27

Rack travel in mm : 15.20...17.80 Speed 1/min: 200 (220) FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1150 Speed 1st version Aneroid pressure h: 1300 Aneroid pressure h: -Del.quantity : 284.0...289.0) Speed rpm: 500
Del.quantity cm3/: 149.0...151.0
1000 s: (146.0...154.0)
Spread cm3: 8.00 cm3 : 5.00 1000 : (9.00) Spread 1000 s: (12.0) RATED SPEED 1st version **BREAKAWAY** Control lever position degrees: 118...126 1st version 1mm rack travel less than Testina: 1st rack travel in: 12.00 Speed rpm : 1190...1200 2nd rack travel in: 4.00 full load rack tr: 12.00 Speed rpm : 1190...1200 Speed Speed rpm : 1285...1315 4th rack travel in: 1450 STARTING FUEL DELIVERY rpm : 0.00...1.00Speed Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0\*\* 1000 s: (-) LOW IDLE 1 Control lever position degrees: 76...84 Speed rpm : 100
Del.quantity cm3/: 0 \*
1000 s: (-)
Rack travel in mm : 17.5...21.0 Testing: Speed : 100 rpm Minimum rack trave: 8.90 : 250 rpm Rack travel in mm : 7.30...7.50 HIGH IDLE Rack travel in mm : 2.00 : 430...490 1st version Speed rpm Speed rpm : 500 Rack travel in mm : < 7.00Aneroid/Altitude Del.quantity cm3/: 0 \* 1000 s: (-) Compensator Test 1st version 2nd version Speed rpm : 500 Rack travel in mm : < 7.50 Setting Speed : 500 rpm Del.quantity cm3/: < 50.0 1000 s: (-) hPa : 1300 Pressure : 13.00...13.10 Rack travel mm Measurement 3rd version Speed rpm : 500 Rack travel in mm : 8.10...8.30 1/min: 500 Speed Del.quantity cm3/: 125.0... 1000 s: (-) 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 100 Rack travel in m: 9.30...9.40 LOW IDLE 3rd pressure hPa : 470 Speed rpm : 250 Rack travel in mm : 7.30...7.50 Rack travel in m: 12.00...12.40 Del.quantity cm3/: 52.0...60.0 \*\* 1000 s: (-) START CUT-OUT

Remarks:

: MAN-NR. 2-7961

\* applies to cylinders 1, 2, 3, 7 and 9
\*\* applies for cylinders 4, 5, 6, 8 and 10

**APPLICATION** 

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MB 14,7 g 9 Test sheet Edition : 27.05.91 : 26.4.91 Replaces Test oil : ISO-4113

: 0 402 678 814 Combination no.

Injection pump

Pump designation : PE8P120A320LS7801-2

EP type number : 0 412 628 825

Governor

: RSV350...1050P0A535-Governor design.

: 0 421 833 352 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

Engine : 0M442LA

: 260.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

: 1 680 750 067 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (4.15...5.35) Rack travel in mm : 9.00...12.00

: 8- 7- 2- 6- 3- 5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 500 1st speed

Rack travel in mm : 13.90...14.10

Del.quantity cm3/: 20.1...20.3

100 s: (19.8...20.6)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 350.0 2nd speed

Rack travel in mm : 5.6...5.8 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.8

Spread 100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500 Aneroid pressure h: 700

Del.quantity : 201.0...203.0 1000 : (198.0...206.0)

: 5.00 cm3 Spread

1000 : (9.00)

RATED SPEED

Control lever position degrees: 90...98 Testing: 1st rack travel in: 11.50 rpm : 1070...1080 Speed 2nd rack travel in: 4.00 rpm : 1140...1158 Speed 4th rack travel in: 1400 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever position degrees: 68...76 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm : 5.7 Testing: Speed : 100 rpm Minimum rack trave: 19.50 : 350 man Rack travel in mm : 5.60...5.80 Rack travel in mm : 2.00 : 370...430 Speed rpm SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1030
Rack travel in m: 12.50...12.70
2nd speed rpm : 700
Rack travel in m: 14.10...14.30 3rd speed rpm : 900 Rack travel in m: 13.30...13.60 Aneroid/Altitude Compensator Test 1st version Settina : 600 Speed rpm Pressure hPa : 700 Rack travel mm : 13.90...14.10 Measurement  $1/\min : 600$ Speed 1st pressure hPa : 400 Rack travel in m: 12.30...12.50 2nd pressure hPa : 925 Rack travel in m: 14.00...14.10 \* 3rd pressure hPa Rack travel in m: 10.80...11.10 FUEL DELIVERY CHARACTERISTICS

1st version

1st version Aneroid pressure h: 1100 : 1030 Speed rpm Del.quantity cm3/: 181.0...184.0 1000 s: (178.0...187.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1100 Speed rpm : 700 Del.quantity cm3/: 213.0...217.0 1000 s: (210.0...220.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 143.0...145.0 1000 s: (140.0...148.0) cm3 : 8.00 Spread 1000 s: (-)

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.50 Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 180.0...200.0 1000 s: (176.0...204.0)

Remarks:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MAN 11,9 t Test sheet : 05.06.91 : 18.1.91 Edition Replaces : ISO-4113 Test oil

: 0 402 736 808 Combination no.

Injection pump

Pump designation : PES6P120A720/3LS7209

EP type number : 0 412 726 837

Governor

Governor design. : RQV300...1000PA962-1

: 0 421 815 248 Governer no.

Customer-spec. information Customer : MAN

: D2866LF06 Engine

: 309.0 : 2000 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90 : (4.75...4.95)

Rack travel in mm : 15.00...16.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

rpm: 900 1st speed

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 28.5...28.7

100 s: (28.2...29.0)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm: 4.8...5.2

Del.quantity cm3/: 2.0...2.6 100 s: (1.7...2.9)

cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump

with governor

Spread

GUIDE SLEEVE TRAVEL rpm : 1045 1st speed

: 8.40...8.60 travel mm

2nd speed rpm : 300

: 2.10...2.30 rpm : 500 travel mm

3rd speed

: 4.10...4.50 rpm : 900 travel mm

4th speed

: 6.50...6.90 travel mm

rpm : 1350 5th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Aneroid pressure h: 1300 Del.quantity : 285.0...287.0 1000 : (282.0...290.0) 2nd pressure hPa : 220
Rack travel in m: 9.10...9.20
3rd pressure hPa : 720 : 5.00 Rack travel in m: 11.40...11.60 Spread cm3 1000 : (9.00) START CUT-OUT RATED SPEED 1/min : 220 (240) Speed 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 284...292 Testing: 1st version 1st rack travel in: 12.10 Aneroid pressure h: 1300 rpm : 1040...1050 Speed Speed rpm : 1000 Del.quantity cm3/: 261.0...265.0 1000 s: (258.0...268.0) Aneroid pressure h: 1300 Speed rpm : 750 2nd rack travel in: 4.00 Speed rpm : 1140...1170 4th rack travel in: 1300 rpm : 0.00...1.00Speed Del.quantity cm3/: 271.0...277.0 1000 s: (268.0...280.0) LOW IDLE 1 Control lever Aneroid pressure h: position degrees: 240...248 Speed : 500 rpm Del.quantity cm3/: 166.0...168.0 1000 s: (163.0...171.0) Testing: Speed : 100 rpm Minimum rack trave: 6.50 : 300 Speed **BREAKAWAY** rom Rack travel in mm : 4.90...5.10 1st version CONSTANT REGULATION 1mm rack travel less than rpm : 320...440 Speed full load rack tr: 12.10 TORQUE CONTROL rpm : 1040...1050 Speed Dimension a mm Torque control curve - 1st version STARTING FUEL DELIVERY : 900 1st speed rpm Rack travel in m: 13.50...13.60 : 1000 2nd speed rpm Speed rpm : 100 Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0) Rack travel in m: 13.00...13.20 rpm : 750 3rd speed Rack travel in m: 12.70...12.90 4th speed rpm : 400 LOW IDLE Rack travel in m: 11.50...11.70 rpm : 300 Speed Rack travel in mm: 4.80...5.20 Aneroid/Altitude Del.quantity cm3/: 20.0...26.0 Compensator Test 1000 s: (17.0...29.0) cm3 : 8.00Spread 1st version 1000 s: (12.00) Setting Speed : 900 Remarks: rpm hPa : 1300 : MAN-NR. 2-7987 Pressure : 13.50...13.60 Rack travel mm Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 Measurement 1/min: 900 Speed start of delivery 1st pressure hPa :-

Rack travel in m: 8.80...9.00

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : RVI 12,0 i Test sheet : 03.06.91 Edition : 16.2.90 Replaces : ISO-4113 Test oil Combination no. : 0 402 746 878 Injection pump Pump designation : PES6P120A320RS7191 : 0 412 726 828 EP type number Governor Governor design. : RQV275...1000PA927 : 0 421 813 808 Governer no. Customer-spec. information : RVI Customer : MIDR 06-35-40 Engine : 314.0 1st version kW : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Openina : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 075 Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

Prestroke mm : 4.80...4.90 : (4.75...4.95) Rack travel in mm : 12.50...13.50 Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasina Tolerance + - ° : 0.50 (0.75) BASIC SETTING rpm: 600 1st speed Rack travel in mm : 14.00...14.10 Del.quantity cm3/: 27.8...28.0 100 s: (27.5...28.3) cm3 : 0.5Spread 100 s: (0.9) rpm : 275% 2nd speed Rack travel in mm : 4.50...4.90 Del.quantity cm3/: 2.1...2.7 100 s: (1.8...3.0) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed mar 1.10...1.50 travel mm 500 2nd speed rom 3.60...4.20 travel mm : 700 3rd speed man 5.50...5.90 travel mm : 1000 4th speed rpm 7.60...7.80 travel mm 5th speed 1400 rpm : 11.00...12.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1060 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 900 Del.quantity : 278.0...280.0 Del.quantity : 2/8.0...283.0)

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 300...308 Testina: 1st rack travel in: 13.10 Speed rpm : 1065...1075 2nd rack travel in: 4.00 rpm : 1195...1225 Speed 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 245...253 Testing: : 200 Speed rom Minimum rack trave: 5.90 : 275 rpm Rack travel in mm : 4.60...4.80 CONSTANT REGULATION rpm : 330...430 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 900 Pressure Rack travel mm : 14.00...14.10 Measurement  $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 9.50...9.90 2nd pressure hPa : 520 Rack travel in m: 13.30...13.40 : 200 3rd pressure hPa Rack travel in m: 10.60...11.00 START CUT-OUT 1/min: 225 (245) Speed

Del.quantity cm3/: 271.0...277.0 1000 s: (268.0...280.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 153.0...155.0 1000 s: (150.0...158.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 1065...1075 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 145.0...175.0 1000 s: (141.0...179.0) LOW IDLE Speed rpm : 275
Rack travel in mm : -9.10...-9.50
Del.quantity cm3/ : 21.0...27.0
1000 s: (18.0...30.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks:

1st version

Aneroid pressure h: 900 Speed : 1000 rpm

FUEL DELIVERY CHARACTERISTICS

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 17...19 Note remarks : 4.35...4.45 Test sheet : FOR 7,8 k Prestroke mm : (4.30...4.50) Edition : 27.05.91 Rack travel in mm : 9.00...12.00 : 16.11.90 Replaces : 1-5-3-6-2-4 Test oil : ISO-4113 Firing order Combination no. : 0 402 746 889 : 0-60-120-180-240-300 Injection pump Phasing Pump designation : PES6P120A720RS7179 : 0.50 (0.75)EP type number : 0 412 726 826 Tolerance + - ° Governor Governor design. : RQV350...1000PA917-1 Time to cyl. no. : 1 : 0 421 815 236 BASIC SETTING Governer no. Customer-spec. information 1st speed rpm: 1000 Customer : FNH Rack travel in mm : 12.80...12.90 : 7.81 Engine Del.quantity cm3/: 16.3...16.5 1st version kW : 160.0 : 2000 100 s: (16.0...16.8) Rated speed TEST BENCH REQUIREMENTS Spread cm3 : 0.7100 s: (1.1) Test oil inlet temp. °C : 38...42 rpm : 350.0 2nd speed Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 2.0...2.6 Overflow valve : 2 417 413 072 100 s: (1.8...2.8) Inlet press., bar: 1.50 Spread cm3 : 0.5100 s: (0.9) Overflow quantity min. 1/h: 160...170 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 GUIDE SLEEVE TRAVEL assembly rpm : 350 : 2.10...2.40 1st speed travel mm Opening pressure, bar : 207...210 2nd speed : 450 rpm travel mm : 3.50...3.90 Orifice plate 3rd speed rpm : 800 : 6.90...7.30 : 0,6 diameter mm travel mm 4th speed rpm : 1000 : 8.60...8.80 travel mm Test lines : 1 680 750 008 5th speed rpm : 1200 : 10.70...11.10 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X2.00X600 Control-lever position x Length mm Degree: -1 rpm : 1230 (A) Injection pump setting values Speed Insp. values in parentheses Rack travel in mm : 6.00...13.00 Set equal delivery quant.

FULL LOAD DELIV. AT FULL LOAD STOP

per values \_\_\_

Rack travel in m: 8.50...8.90 2nd pressure hPa : 565
Rack travel in m: 10.00...10.10
3rd pressure hPa : 715 1st version rpm : 1000 Speed Aneroid pressure h: 1400 : 163.0...165.0 Rack travel in m: 10.90...11.30 Del.quantity 1000 : (160.0...168.0) : 7.00 START CUT-OUT Spread cm31000 : (11.00) 1/min : 290 (310) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 112...120 1st version Aneroid pressure h: 1400 Testing: Speed : 750 rom Del.quantity cm3/: 190.0...196.0 1000 s: (187.0...199.0) 1st rack travel in: 11.80 rpm : 1050...1060 Speed 2nd rack travel in: 4.00 cm3 : 8.00 Spread Speed rpm : 1165...1195 4th rack travel in: 1300 1000 s: (12.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 106.0...108.0 Speed rpm : 0.00...1.001000 s: (103.0...111.0) LOW IDLE 1 Control lever position degrees: 63...71 **BREAKAWAY** Testing: Speed 1st version : 275 rpm Minimum rack trave: 6.70 1mm rack travel less than : 350 rpm Rack travel in mm : 5.00...5.40 full load rack tr: 11.80 rpm : 1050...1060 Speed CONSTANT REGULATION rpm : 320...500 STARTING FUEL DELIVERY Speed TORQUE CONTROL Dimension a mm : 100 Speed rpm Del.quantity cm3/: 150.0...180.0 Torque control curve - 1st version 1000 s: (146.0...186.0) 1st speed : 1000 rpm Rack travel in m: 12.80...12.90 Rack travel in mm : 10.90...11.50 rpm : 750 2nd speed Rack travel in m: 13.30...13.50 LOW IDLE 3rd speed rpm : 650 Speed rpm: 350
Rack travel in mm: 5.00...5.40
Del.quantity cm3/: 20.0...26.0 Rack travel in m: 12.70...13.10 Aneroid/Altitude Compensator Test 1000 s: (18.0...28.0) cm3 : 5.00Spread 1000 s: (9.50) 1st version Setting Remarks: Speed : 750 : FNH # E9HN-9A543-PA rpm hPa : 1400 Pressure : 13.30...13.50 Bow dimension: Rack travel mm Sliding-sleeve position = 37.0 mm Measurement 1/min: 750 Speed

1st pressure hPa : -

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: UNI 9,5 i : 03.06.91 Test sheet Edition : 27.2.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 746 901

Injection pump

Pump designation : PES6P120A720RS7224 : 0 412 726 840 EP type number

Governor

Governor design. : RQV275...1100PA975K

: 0 421 815 266 Governer no.

Customer-spec. information Customer : IVECO-UNIC

: 8460,41,406 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20 : (5.05...5.25)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 275.0 2nd speed

Rack travel in mm : 5.1...5.5 Del.quantity cm3/ : 3.2...3.8 100 s: (2.9...4.1)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1145 1st speed

: 10.30...10.50 travel mm

rpm : 275 2nd speed

: 1.30...1.50 rpm : 450 travel mm

3rd speed : 3.40...4.00 : 750 travel mm

4th speed rpm

: 5.90...6.30 travel mm

rpm : 1350 5th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 1200

Del.quantity : 234.0...239.0)

**B25** 

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 115...123 Testing: 1st rack travel in: 11.40 Speed rpm : 1140...1150 2nd rack travel in: 4.00 rpm : 1220...1250 Speed 4th rack travel in: 1350 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 63...71 Testing: Speed rpm : 100 Minimum rack trave: 6.80 rpm : 275 Rack travel in mm : 5.20...5.40 Rack travel in mm : 2.00 CONSTANT REGULATION Speed rpm : 270...400 TORQUE CONTROL Dimension a mm Torque control curve - 1st version : 1100 1st speed rpm Rack travel in m: 12.40...12.50 rpm : 900 2nd speed Rack travel in m: 12.30...12.60 3rd speed rpm : 700 Rack travel in m: 11.90...12.10
4th speed rpm : 500
Rack travel in m: 11.20...11.50
5th speed rpm : 350
Rack travel in m: 10.80...11.20 Aneroid/Altitude Compensator Test 1st version Setting : 900 Speed rpm hPa : 1200 Pressure Rack travel mm : 12.40...12.50 Measurement 1/min: 900 Speed 1st pressure hPa :-Rack travel in m: 7.60...7.80

2nd pressure hPa : 710 Rack travel in m: 11.20...11.30 3rd pressure hPa : 400 Rack travel in m: 8.60...9.00 START CUT-OUT 1/min: 195 (215) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm: 900 Del.quantity cm3/: 240.0...246.0 1000 s: (237.0...249.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.40 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 150.0...180.0 1000 s: (146.0...184.0) LOW IDLE Speed rpm : 275
Rack travel in mm : 5.10...5.50
Del.quantity cm3/ : 32.0...38.0
1000 s: (29.0...41.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: UNI 9,5 i 1 Test sheet Edition : 03.06.91 Replaces : 1.3.91

: ISO-4113 Test oil

Combination no. : 0 402 746 902

Injection pump

Pump designation : PES6P120A720RS7224

: 0 412 726 840 EP type number

Governor

Governor design. : RQV275...1100PA975-1

: 0 421 815 267 Governer no.

Customer-spec. information : IVECO-UNIC Customer

Engine : 8460.41.320

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Lenath mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.10...5.20 : (5.05...5.25) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 275.0 2nd speed

Rack travel in mm : 5.1...5.5 Del.quantity cm3/ : 3.2...3.8 100 s: (2.9...4.1)

cm3 : 0.8Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1145 1st speed

10.30...10.50 travel mm

: 275 2nd speed rpm

: 1.30...1.50 travel mm

: 450 3rd speed mar

: 3.40...4.00 travel mm

: 750 4th speed rpm

: 5.90...6.30 travel mm

5th speed : 1350 rpm

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1140 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200 Del.quantity : 209.0...211.0

Del.quantity : 209.0...214.0)

: 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 115...123 Testing: 1st rack travel in: 10.20 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1200...1230 Speed 4th rack travel in: 1350 rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever position degrees: 64...72

Testing: Speed : 100 rpm Minimum rack trave: 6.80 : 275 rom Rack travel in mm : 5.20...5.40 Rack travel in mm : 2.00

CONSTANT REGULATION rpm : 270...400 Speed

TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 11.20 ...11.30 2nd speed rpm : 900 Rack travel in m: 10.70...10.90

3rd speed rpm : 700

Rack travel in m: 9.90...10.10

4th speed rpm : 400

Rack travel in m: 9.30...9.70

Aneroid/Altitude Compensator Test

1st version Setting : 1100 Speed rpm hPa : 1200 Pressure : 11.20...11.30 Rack travel mm

Measurement 1/min: 1100 Speed 1st pressure hPa : -

Rack travel in m: 7.70...7.90 2nd pressure hPa : 600

Rack travel in m: 10.60...10.70

3rd pressure hPa : 420

Rack travel in m: 9.10...9.50

START CUT-OUT

Speed 1/min: 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200 Speed rpm : 700

Del.quantity cm3/: 188.0...194.0 1000 s: (185.0...197.0)

Aneroid pressure h: -

Speed rpm: 500
Del.quantity cm3/: 120.0...122.0
1000 s: (117.0...125.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.20 Speed rpm : 1140...1150

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.10...5.50
Del.quantity cm3/ : 32.0...38.0
1000 s: (29.0...41.0)

Spread cm3 : 8.00 1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

**B28** 

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: UNI 9,5 i 2 Test sheet Edition : 03.06.91 : 1.3.91 Replaces

: ISO-4113 Test oil

Combination no. : 0 402 746 903

Injection pump

Pump designation : PES6P120A720RS7224

: 0 412 726 840 EP type number

Governor

: RQV275...1100PA888-1 Governor design.

: 0 421 815 268 Governer no.

Customer-spec. information : IVECO-UNIC Customer

: 8460.41.160 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20

: (5.05...5.25)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 11.80...11.90

Del.guantity cm3/: 22.4...22.6

100 s: (22.1...22.9)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 275.0
Rack travel in mm : 5.2...5.6
Del.quantity cm3/ : 3.0...3.6

100 s: (2.7...3.9)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1145

: 10.10...10.30 travel mm

rpm : 275 2nd speed

: 1.10...1.30 travel mm

rpm : 400 3rd speed : 2.50...3.10 travel mm

: 750

4th speed rpm

: 5.50...5.90 : 1350 travel mm

5th speed rpm

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1150 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 900

Del.quantity : 224.0...229.0)

Spread cm3

cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 10.60

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1350

rom : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 66...74

Testing:

Speed : 100 rpm Minimum rack trave: 6.90

Speed rpm

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 270...400 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

rpm : 850 1st speed

Rack travel in m: 11.80...11.90

: 1100 2nd speed rpm

Rack travel in m: 11.60...11.80

3rd speed rpm : 700

Rack travel in m: 11.20...11.40

4th speed rpm : 400

Rack travel in m: 10.70...11.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 850 rpm hPa : 900 Pressure

: 11.80...11.90 Rack travel mm

Measurement

1/min: 850 Speed

1st pressure hPa : -

Rack travel in m: 8.10...8.30

2nd pressure hPa : 640 Rack travel in m: 10.90...11.00

3rd pressure hPa : 400

Rack travel in m: 8.90...9.20

START CUT-OUT

Speed 1/min: 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 1100 Del.quantity cm3/: 210.0...216.0

1000 s: (207.0...219.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 127.0...129.0 1000 s: (124.0...132.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.60

rpm : 1140...1150 Speed

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.20...5.60
Del.quantity cm3/ : 30.0...36.0
1000 s: (27.0...39.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : UNI 9,5 g : 27.05.91 Test sheet Edition Replaces : 16.1.91 : ISO-4113 Test oil Combination no. : 0 402 746 904 Injection pump Pump designation : PES6P120A720RS7154 EP type number : 0 412 726 811 Governor Governor design. : RQ275/1100PA980 : 0 421 801 555 Governer no. Customer-spec. information : IVECO-UNIC Customer : 8460,41,101 Engine TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0.8 : 1 680 750 008 Test lines Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 5.00...5.10

: (4.95...5.15)

: 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75)Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 11.60...11.70 Del.quantity cm3/: 19.3...19.5 100 s: (19.0...19.8) cm3 : 0.5Spread 100 s: (0.9) rpm : 275.0 2nd speed Rack travel in mm: 4.8...5.2 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.8 Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100 Speed Aneroid pressure h: 900 Del.quantity : 193.0...198.0) cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm: 20.0 Testina: 1st rack travel in: 10.60

rpm : 1145...1160

rpm : 1225...1255

Speed

Speed

2nd rack travel in: 4.00

Prestroke mm

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 275 Rack travel in mm : 5.0

Testina:

rpm : 100 Speed Minimum rack trave: 7.50 rpm : 275

Rack travel in mm : 4.90...5.10 Rack travel in mm : 2.00

rpm : 330...370 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 11.60...11.70

2nd speed rpm : 600

Rack travel in m: 11.60...11.80

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 900 Pressure

Rack travel mm : 11.60...11.70

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60 2nd pressure hPa : 415 Rack travel in m: 10.90...11.00

3rd pressure hPa : 320 Rack travel in m: 9.90...10.20

START CUT-OUT

1/min: 195 (215) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 127.0...129.0

1000 s: (124.0...132.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.60

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 180.0...200.0 1000 s: (176.0...204.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.80...5.20
Del.quantity cm3/ : 16.0...22.0
1000 s: (13.0...25.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

CO4

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : RVI 8,8 S 3 : 03.06.91 Edition : 18.02.91 Replaces : ISO-4113 Test oil Combination no. : 0 403 446 235 Injection pump Pump designation : PES6MW100/320RS1171 : 0 413 406 156 EP type number Governor Governor design. : RQV300...1300MW80-5 : 0 420 083 197 Governer no. Customer-spec. information Customer : RVI Engine : MIDS 060212B : 113.0 1st version kW Rated speed : 2600 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 033 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness : 6.00X2.00X600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

: 3.00...3.10 : (2.95...3.15) Prestroke mm Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING rpm: 1300 1st speed Rack travel in mm : 10.80...10.90 Del.quantity cm3/: 8.8...9.0 100 s: (8.6...9.2) cm3 : 0.3Spread 100 s: (0.6) rpm : 300.02nd speed Rack travel in mm : 5.40...5.80 Del.quantity cm3/ : 1.6...2.0 100 s: (1.3...2.2) cm3 : 0.3 Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1500 1st speed travel mm : 8.70...9.10 2nd speed : 1350 rpm : 7.60...7.80 travel mm 500 3rd speed rpm : 2.80...3.40 travel mm : 300 4th speed rpm : 1.20...1.60 travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1300 Aneroid pressure h: 700 Del.quantity 1000 : 88.0...90.0 : (86.0...92.0) : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 60...68

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Testing: 1st rack travel in: 9.80 Speed rpm: 1390...1400
2nd rack travel in: 4.00
Speed rpm: 1505...1535
4th rack travel in: 1700 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 10...18 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.2 Testina: : 200 Speed rpm Minimum rack trave: 7.00 : 300 Speed rpm Rack travel in mm : 5.40...5.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rom hPa : -Pressure : 8.80...8.90 Rack travel mm Measurement Speed  $1/\min : 500$ 1st pressure hPa : 100 Rack travel in m: 9.30...9.40 2nd pressure hPa : 200 Rack travel in m: 10.20...10.50 3rd pressure hPa : 700 Rack travel in m: 10.80...10.90 START CUT-OUT Speed 1/min : 230 (250) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 900 Speed rpm 1000 s: (7.0)

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 9.80 rpm : 1390...1400 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 90.0...110.0 1000 s: (87.0...113.0) Rack travel in mm: 19.50...21.00

LOW IDLE

Speed rpm : 300 Rack travel in mm : 5.40...5.80

Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.501000 s: (5.50)

Remarks:

Spread

Start-of-delivery mark mode with prestroke 3.00...3.10 mm at barrel 1

**CO6** 

Speed

Aneroid pressure h: -

rpm : 500

1000 s: (45.0...51.0)

Del.quantity cm3/: 47.0...49.0

: 4.00...4.10 : (3.95...4.15) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks : FIA 8,1 D Test sheet : 03.06.91 Edition Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasina Tolerance + - ° Combination no. : 0 403 446 249 : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/720RS1197 EP type number : 0 413 406 185 1st speed rpm: 1350 Governor Governor design. : RQV325...1350MW109K Rack travel in mm : 14.00...14.10 : 0 420 083 997 Governer no. Del.quantity cm3/: 10.0...10.2 Customer-spec. information 100 s: (9.8...10.4) Customer : IVECO-FIAT : 8060.45.6700 cm3 : 0.3Engine Spread 1st version kW : 165.0 100 s: (0.6) Rated speed : 2700 2nd speed rpm : 325.0 Rack travel in mm : 7.7...7.9 TEST BENCH REQUIREMENTS Del.quantity cm3/ : 2.5...2.9 100 s: (2.2...3.1) Test oil inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 1 457 413 010 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 1400 : 1 688 901 101 : 10.00...10.40 assembly travel mm 2nd speed : 825 rpm : 4.90...5.10 Opening . travel mm : 207...210 3rd speed 400 pressure, bar rpm 2.90...3.50 travel mm Orifice plate 4th speed rpm : 1.50...1.90 diameter mm : 0,6 travel mm GUIDE SLEEVE POSITION Test lines : 1 680 750 014 Control-lever position Degree: -1 rpm : 1410 Outside diameter Speed Rack travel in mm : 15.20...17.80 x Wall thickness : 6.00X2.00X600 x Length mm FULL LOAD DELIV. AT FULL LOAD STOP (A) Injection pump setting values Insp. values in parentheses 1st version Speed rpm : 1350 Set equal delivery quant. Aneroid pressure h: 850 per values Del.quantity : 100.0...104.0) BEGINNING OF DELIVERY

: 3.50

: (6.00)

cm3 1000

Spread

Test pressure, bar: 30...32

	1
RATED SPEED	1st version
1st version Control lever position degrees: 117125	Aneroid pressure h: 850 Speed rpm : 1200 Del.quantity cm3/: 102.5105.5 1000 s: (100.0108.0)
Testing: 1st rack travel in: 13.00 Speed rpm : 14101420 2nd rack travel in: 4.00 Speed rpm : 14951525 4th rack travel in: 1600 Speed rpm : 0.001.00	Spread cm3: 5.00 - 1000 s: (7.0) - Aneroid pressure h: 850 - Speed rpm: 1000 - Del.quantity cm3/: 101.5104.5 - 1000 s: (99.0107.0) - Aneroid pressure h: 850 - Speed rpm: 600
LOW IDLE 1 Control lever position degrees: 7886 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 7.8	Del.quantity cm3/: 106.5109.5 1000 s: (104.0112.0) Aneroid pressure h: - Speed rpm: 500 Del.quantity cm3/: 77.579.5 1000 s: (75.581.5)
Testing: Speed rpm : 200 Minimum rack trave: 10.00 Speed rpm : 325 Rack travel in mm : 7.707.90	BREAKAWAY  1st version 1mm rack travel less than
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1350 Rack travel in m: 14.0014.10 2nd speed rpm : 1200 Rack travel in m: 13.7013.90 3rd speed rpm : 1000 Rack travel in m: 13.3013.50 4th speed rpm : 600 Rack travel in m: 13.3013.50  Aneroid/Altitude Compensator Test  1st version Setting Speed rpm : 500 Pressure hPa : - Rack travel mm : 11.3011.40  Measurement	full load rack tr: 13.00 Speed rpm : 14101420  STARTING FUEL DELIVERY  Speed rpm : 100 Del.quantity cm3/ : 65.085.0 1000 s: (62.088.0)  LOW IDLE  Speed rpm : 325 Rack travel in mm : 7.707.90 Del.quantity cm3/ : 25.029.0 1000 s: (22.531.5) Spread cm3 : 3.50 1000 s: (5.50)  Remarks:
Measurement Speed 1/min: 500  1st pressure hPa: 450 Rack travel in m: 11.7011.80 2nd pressure hPa: 650 Rack travel in m: 12.8013.10 3rd pressure hPa: 850	† † † † †
Rack travel in m: 13.3013.50  FUEL DELIVERY CHARACTERISTICS	+

c08

## BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: MB 6,1 D 3 : 03.06.91 Test sheet Edition : 19.03.91 Replaces Test oil : ISO-4113

Combination no. : 0 403 446 279

Injection pump

Pump designation : PES6MW100/720RS1131

EP type number : 0 413 406 123

Governor

Governor design. : RQV300...1200MW105-6

: 0 420 082 054 Governer no.

Customer-spec. information Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 115.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 715 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm : (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 10.20...10.30

Del.quantity cm3/: 8.4...8.6

100 s: (8.2...8.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6) cm3 : 0.3 Spread

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300 : 8.80...9.20 travel mm 1200 2nd speed rom 7.40...7.60 travel mm : 700 3rd speed rpm : 6.70...7.30 travel mm 450 4th speed rpm : 5.10...5.70 travel mm 5th speed 300 rpm

GUIDE SLEEVE POSITION Control-lever position Degree: 107

Speed rpm : 800

Rack travel in mm : 14.70...16.30

: 2.60...3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

travel mm

rpm : 1200 Speed Aneroid pressure h: 700

: 84.0...86.0 Del.quantity 1000 : (82.0...88.0) cm3 : 3.50

Spread 1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 94...102 Testing: 1st rack travel in: 9.20 Speed rpm : 1240...1250 2nd rack travel in: 4.00 Speed rpm : 1305...1335 4th rack travel in: 1450 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring : 300 Speed rpm Rack travel in mm: 5.4 Testina: Speed rpm Minimum rack trave: 7.50 Speed rpm: 300 Rack travel in mm: 5.30...5.50 Rack travel in mm: 2.00 : 410...470 Speed rpm TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 10.20...10.30 rpm : 600 2nd speed Rack travel in m: 10.90...11.10 3rd speed rpm : 1100 Rack travel in m: 10.30...10.60 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 200 Pressure Rack travel mm : 8.90...9.00 Measurement Speed 1/min: 500 1st pressure hPa :-Rack travel in m: 8.60...8.70 2nd pressure hPa : 350 Rack travel in m: 10.20...10.50 3rd pressure hPa : 700 Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 : 600 Speed rpm Del.quantity cm3/: 78.0...81.0 1000 s: (75.5...83.5) cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 44.0...46.0 1000 s: (42.0...48.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.20 Speed rpm : 1240...1250 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0) LOW IDLE Speed rpm Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks:

1/min : 200 (230)

Speed

START CUT-OUT

: 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order Note remarks : 0-60-120-180-240-300 Test sheet : MWM 6,2 F Phasing Edition : 27.05.91 Tolerance + - ° : 0.50 (0.75) Replaces Test oil : ISO-4113 BASIC SETTING Combination no. : 0 403 446 281 1st speed rpm: 1000Injection pump Rack travel in mm : 12.40...12.50 Pump designation : PES6MW100/720RS1217 : 0 413 406 207 EP type number Del.quantity cm3/: 14.4...14.6 Governor Governor design. : RQ300/1000MW116 100 s: (14.2...14.8) Governer no. : 0 420 082 056 Customer-spec. information Spread cm3 : 0.3Customer : MWM 100 s: (0.6) Engine : TBD226B-6 rpm : 300.02nd speed : 150.0 Rack travel in mm: 5.9...6.1 1st version kW Del.quantity cm3/: 1.1...1.5 : 2000 Rated speed 100 s: (0.8...1.7) cm3 : 0.3 100 s: (0.5) TEST BENCH REQUIREMENTS Spread Test oil inlet temp. °C : 38...42 (B) Setting of injection pump with governor Overflow valve GUIDE SLEEVE TRAVEL : 1 417 413 047 rpm : 1100 1st speed : 7.30...7.70 : 1000 Inlet press., bar: 1.50 travel mm 2nd speed rpm : 5.90...6.10 Test nozzle holder travel mm : 0 681 343 009 : 370 assembly 3rd speed rpm : 4.70...5.30 travel mm rpm : 300 Opening 4th speed : 172...175 travel mm : 1.20...1.60 pressure, bar GUIDE SLEEVE POSITION Test lines : 1 680 740 014 Control-lever position Degree: -2 Outside diameter rpm : 600 Rack travel in mm : 19.20...20.80 x Wall thickness : 6.00X2.00X600 x Length mm FULL LOAD DELIV. AT FULL LOAD STOP (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. rpm : 1000 Speed per values Aneroid pressure h: 1200 : 144.0...146.0 Del.quantity 1000 : (142.0...148.0) BEGINNING OF DELIVERY : 3.50 Test pressure, bar: 30...32 Spread cm3 1000 : (6.00) : 4.00...4.10 Prestroke mm : (3.95...4.15) RATED SPEED

Rack travel in mm : 9.00...12.00

1st version Control lever position degrees: 91...99 Setting point: Speed Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.40 rpm : 1040...1055 Speed 2nd rack travel in: 4.00 Speed rpm : 1130...1160 4th rack travel in: 1200 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 28...36 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.0 Testing: Speed : 200 rpm Minimum rack trave: 8.00 : 300 rpm Rack travel in mm : 5.90...6.10 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : -Pressure : 8.70...8.80 Rack travel mm Measurement Speed  $1/\min : 500$ 1st pressure hPa : 300 Rack travel in m: 9.50...9.70 2nd pressure hPa : 650 Rack travel in m: 11.60...11.80 3rd pressure hPa : 1200 Rack travel in m: 12.40...12.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 : 750 Speed rpm Del.quantity cm3/: 143.5...146.5 1000 s: (141.0...149.0) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 64.0...66.0 1000 s: (62.0...68.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.40 rpm : 1040...1055 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 140.0...150.0 1000 s: (137.0...153.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 5.90...6.10 Del.quantity cm3/ : 11.0...15.0 1000 s: (8.5...17.5) cm3 : 3.50Spread 1000 s: (5.50) Remarks:

c12

: 3.25...3.35 : (3.20...3.40) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks : IHC 7,6 W 8 Test sheet : 27.05.91 Edition Replaces : 0-60-120-180-240-300 Test oil : ISO-4113 Phasina : 0 403 446 282 Combination no. Tolerance + - ° : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/320RS1198 EP type number : 0 413 406 188 1st speed Governor Governor design. : RQV350...1200MW46-39 : 0 420 083 246 Governer no. Customer-spec. information Customer : NAVISTAR Engine : DTA-466 Spread 1st version kW : 186.0 : 2400 Rated speed 2nd speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Spread Overflow valve : 2 417 413 038 with governor Inlet press., bar: 2.80 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed : 1 688 901 101 assembly travel mm 2nd speed rpm Openina travel mm : 207...210 pressure, bar 3rd speed rpm travel mm Orifice plate 4th speed rpm diameter mm : 0,6 travel mm Test lines : 1 680 750 008 1st version Outside diameter Speed x Wall thickness x Length mm : 6.00X2.00X600

rpm: 800 Rack travel in mm : 12.10...12.20 Del.quantity cm3/: 13.0...13.2 100 s: (12.8...13.4) cm3 : 0.3100 s: (0.6) rpm : 350.0Rack travel in mm: 5.2...5.4 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) cm3 : 0.3 100 s: (0.5) (B) Setting of injection pump rpm : 1450 : 9.80...10.20 : 1250 : 7.90...8.10 : 550 : 3.10. .3.70 : 350 : 1.30...1.70 FULL LOAD DELIV. AT FULL LOAD STOP rpm : 800 Aneroid pressure h: 1200 Del.quantity : 130.0...134.0) Spread cm3 : 3.50 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 100...108

(A) Injection pump setting values

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Insp. values in parentheses Set equal delivery quant.

Testing: 1st rack travel in: 11.10 Speed rpm: 1270...1290 2nd rack travel in: 4.00 Speed rpm : 1400...1410 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 66...74 Setting point w/out bumper spring rpm Rack travel in mm: 5.3 Testing: Speed : 100 rpm Minimum rack trave: 9.00 : 350 Speed rpm Rack travel in mm : 5.20...5.40 CONSTANT REGULATION Speed rpm : 300...450 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 500 Pressure hPa : -: 9.10...9.20 Rack travel mm Measurement 1/min : 500Speed 1st pressure hPa : 225 Rack travel in m: 9.80...9.90 2nd pressure hPa : 490 Rack travel in m: 11.20...11.60 3rd pressure hPa : 1200 Rack travel in m: 12.10...12.20 START CUT-OUT 1/min: 280 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1200 Del.quantity cm3/ : 126.5...130.5 1000 s: (124.5...132.5) cm3 : 6.50 Spread

1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/ : 69.5...71.5
1000 s: (67.5...73.5)
BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.10 Speed rpm : 1270...1290

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 150.0...190.0 1000 s: (145.0...195.0) Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm: 350
Rack travel in mm: 5.20...5.40
Del.quantity cm3/: 16.0...20.0
1000 s: (13.5...22.5)
Spread cm3: 3.50
1000 s: (5.50)

Remarks:

: IHC #1817694C91

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter.

In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : IHC 7,6 W 7 : 27.05.91 Test sheet Edition Replaces Test oil : ISO-4113 Combination no. : 0 403 446 283 Injection pump Pump designation : PES6MW100/320RS1198 : 0 413 406 188 EP type number Governor Governor design. : RQV350...1200MW46-40 : 0 420 083 247 Governer no. Customer-spec. information Customer : NAVISTAR Engine : DTA-466 1st version kW : 186.0 Rated speed : 2400 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 038 Inlet press., bar: 2.80 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Insp. values in parentheses Set equal delivery quant.

Prestroke mm : 3.25...3.35 : (3.20...3.40) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasina Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 800 Rack travel in mm : 12.50...12.60 Del.quantity cm3/: 13.3...13.5 100 s: (13.1...13.7) cm3 : 0.3Spread 100 s: (0.6) 2nd speed rpm : 350.0Rack travel in mm: 5.2...5.4 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) Spread cm3 : 0.3100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1450 1st speed : 9.80...10.20 travel mm rpm : 1250 2nd speed : 7.90...8.10 travel mm 3rd speed rpm : 550 : 3.10...3.70 : 350 : 1.30...1.70 travel mm 4th speed rpm travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 800 Speed Aneroid pressure h: 1200 : 133.5...135.5 1000 : (131.5...137.5) cm3 : 3.50 Del.quantity Spread 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 102...110

Testina: 1st rack travel in: 11.50 rpm : 1270...1290 Speed 2nd rack travel in: 4.00 Speed rpm : 1400...1410 4th rack travel in: 1500 Speed rpm: 0.00...1.00 LOW IDLE 1 Control lever position degrees: 66...74 Setting point w/out bumper spring rpm Rack travel in mm: 5.3 Testing: Speed rpm : 100 Minimum rack trave: 9.00 Speed rpm Rack travel in mm : 5.20...5.40 CONSTANT REGULATION rpm : 300...450 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rom Pressure hPa : -: 9.00...9.10 Rack travel mm Measurement 1/min : 500Speed 1st pressure hPa : 335 Rack travel in m: 10.00...10.10 2nd pressure hPa : 645 Rack travel in m: 11.40...11.80 3rd pressure hPa : 1200 Rack travel in m: 12.50...12.60 START CUT-OUT Speed 1/min : 280 (290) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1200
Del.quantity cm3/: 130.0...134.0
1000 s: (128.0...136.0)

cm3 : 6.50

1000 s: (7.0)

rpm : 500 Speed Del.quantity cm3/: 68.0...70.0 1000 s: (66.0...72.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.50 rpm : 1270...1290 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 150.0...190.0 1000 s: (145.0...195.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 5.20...5.40 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) Spread cm3: 3.50 1000 s: (5.50) Remarks: : IHC #1817695C91 overflow valve without IH hose and restrictor 1.2 mm diameter. In unlatched condition, do not operate greater than n = 500 1/min

Only perform pump setting with original

Set shutoff stop 1.5...2.0 mm before shutoff.

Spread

Aneroid pressure h: -

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAN 7,2 Q Test sheet Edition : 27.05.91 Replaces : 17.09.90 Test oil : ISO-4113 Combination no. : 0 403 456 111 Injection pump Pump designation : PES6MW100/321RS1186 : 0 413 406 168 EP type number Governor Governor design. : RQ250/1200MW84-4 Governer no. : 0 420 082 044 Customer-spec. information Customer : MAN Engine : D 0826 LUH 1st version kW : 157.0 Rated speed : 2400 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening : 172...175 pressure, bar Test lines : 1 680 750 008 Outside diameter x Wall thickness : 6.00X2.00X600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32

: 3.60...3.70

Rack travel in mm : 15.00...0.00

: (3.55...3.75)

Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 14.70...14.80 Del.guantity cm3/: 12.6...12.8 100 s: (12.4...13.0) Spread cm3 : 0.3100 s: (0.6) rpm : 250.0 2nd speed Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 1.9...2.3 100 s: (1.6...2.5) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1230 1st speed : 9.50...9.90 travel mm : 1250 2nd speed rpm : 7.50...7.70 travel mm 3rd speed : 350 rpm travel mm : 5.20...5.80 : 250 4th speed rpm : 2.20...2.60 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: 107 rpm : 1200 Rack travel in mm : 14.70...16.30 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1000 Speed Aneroid pressure h: 1000 Del.quantity : 126.0...128.0 1000 : (124.0...130.0) : 3.50 Spread cm3 : (6.00) 1000

Prestroke mm

RATED SPEED +	3rd pressure hPa : 1000 Rack travel in m: 14.8014.90
1st version + Control lever + position degrees: 104112 +	START CUT-OUT
Setting point:	Speed 1/min: 180 (200)
Speed rpm : 1200 Rack travel in mm : 15.5	FUEL DELIVERY CHARACTERISTICS
Testing: 1st rack travel in: 13.30 Speed rpm : 12451260 2nd rack travel in: 4.00 Speed rpm : 12901320 4th rack travel in: 1450 Speed rpm : 0.001.00	1st version Aneroid pressure h: 1000 Speed rpm : 600 Del.quantity cm3/: 126.5129.5 1000 s: (124.0132.0) Spread cm3 : 5.00 1000 s: (7.0) Aneroid pressure h: 1000 Speed rpm : 800
Control lever position degrees: 7078 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.6	Del.quantity cm3/: 126.5129.5 1000 s: (124.0132.0) Aneroid pressure h: 1000 Speed rpm: 1200 Del.quantity cm3/: 123.0126.0 1000 s: (120.5128.5)
Testing: Speed rpm : 100 Minimum rack trave: 7.00 Speed rpm : 250	Aneroid pressure h: - Speed rpm : 500 Del.quantity cm3/: 74.076.0 1000 s: (72.078.0)
Rack travel in mm : 5.505.70 +	
TORQUE CONTROL +	BREAKAWAY
TORQUE CONTROL  Dimension a mm : 0.30  Torque control curve - 1st version  1st speed rpm : 1000  Rack travel in m: 14.7014.80  2nd speed rpm : 600  Rack travel in m: 14.8014.90	BREAKAWAY  1st version 1mm rack travel less than  full load rack tr: 13.30 Speed rpm : 12451260
TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.7014.80 2nd speed rpm : 600 Rack travel in m: 14.8014.90 3rd speed rpm : 800 Rack travel in m: 14.8014.90 4th speed rpm : 1200	1st version 1mm rack travel less than full load rack tr: 13.30
TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.7014.80 2nd speed rpm : 600 Rack travel in m: 14.8014.90 3rd speed rpm : 800 Rack travel in m: 14.8014.90	1st version 1mm rack travel less than full load rack tr: 13.30 Speed rpm : 12451260
TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.7014.80 2nd speed rpm : 600 Rack travel in m: 14.8014.90 3rd speed rpm : 800 Rack travel in m: 14.8014.90 4th speed rpm : 1200 Rack travel in m: 14.3014.40  Aneroid/Altitude Compensator Test	1st version 1mm rack travel less than  full load rack tr: 13.30 Speed rpm : 12451260  STARTING FUEL DELIVERY  Speed rpm : 100 Del.quantity cm3/: 130.0140.0
TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.7014.80 2nd speed rpm : 600 Rack travel in m: 14.8014.90 3rd speed rpm : 800 Rack travel in m: 14.8014.90 4th speed rpm : 1200 Rack travel in m: 14.3014.40 Aneroid/Altitude	1st version 1mm rack travel less than  full load rack tr: 13.30 Speed rpm : 12451260  STARTING FUEL DELIVERY  Speed rpm : 100 Del.quantity cm3/: 130.0140.0 1000 s: (127.0143.0)  LOW IDLE  Speed rpm : 250 Rack travel in mm : 5.505.70 Del.quantity cm3/: 19.023.0 1000 s: (16.525.5) Spread cm3 : 3.50
TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.7014.80 2nd speed rpm : 600 Rack travel in m: 14.8014.90 3rd speed rpm : 800 Rack travel in m: 14.8014.90 4th speed rpm : 1200 Rack travel in m: 14.3014.40  Aneroid/Altitude Compensator Test  1st version Setting Speed rpm : 500 Pressure hPa : 200	1st version 1mm rack travel less than  full load rack tr: 13.30 Speed rpm : 12451260  STARTING FUEL DELIVERY  Speed rpm : 100 Del.quantity cm3/: 130.0140.0 1000 s: (127.0143.0)  LOW IDLE  Speed rpm : 250 Rack travel in mm : 5.505.70 Del.quantity cm3/: 19.023.0 1000 s: (16.525.5) Spread cm3 : 3.50 1000 s: (5.50)
TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.7014.80 2nd speed rpm : 600 Rack travel in m: 14.8014.90 3rd speed rpm : 800 Rack travel in m: 14.8014.90 4th speed rpm : 1200 Rack travel in m: 14.3014.40  Aneroid/Altitude Compensator Test  1st version Setting Speed rpm : 500 Pressure hPa : 200 Rack travel mm : 12.7012.80  Measurement	1st version 1mm rack travel less than  full load rack tr: 13.30 Speed rpm : 12451260  STARTING FUEL DELIVERY  Speed rpm : 100 Del.quantity cm3/: 130.0140.0 1000 s: (127.0143.0)  LOW IDLE  Speed rpm : 250 Rack travel in mm : 5.505.70 Del.quantity cm3/: 19.023.0 1000 s: (16.525.5) Spread cm3 : 3.50

start of delivery

Note remarks

: MAN 7,3 C : 03.06.91 Test sheet Edition : 19.03.91 Replaces Test oil : ISO-4113

Combination no. : 0 403 456 113

Injection pump

Pump designation : PES6MW100/321RS1210

EP type number : 0 413 406 201

Governor

Governor design. : RQ250/1050MW84-6 : 0 420 082 049 Governer no.

Customer-spec. information Customer

Engine : D 0826 LUH 250

: 184.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 Prestroke mm : (3.45...3.65)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 15.9...16.1

100 s: (15.7...16.3)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.02nd speed Rack travel in mm : 4.9...5.1 Del.quantity cm3/: 1.3...1.7

100 s: (1.0...1.9)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1125

7.30...7.70 travel mm : 1050 2nd speed rpm

: 6.10...6.30 travel mm

3rd speed rpm : 400

: 5.70...6.30 : 250 travel mm

4th speed rpm

: 2.50...2.90 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: 98 rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050 Aneroid pressure h: 1100

Del.quantity : 139.0...163.0)

: 3.50

1000 : (6.00)

# RATED SPEED 1st version Control lever position degrees: 95...103 Setting point: Speed rom Rack travel in mm: 20.0 Testing: 1st rack travel in: 13.00 Speed rpm: 1075...1090 2nd rack travel in: 4.00 Speed rpm: 1130...1160 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring rpm : 250 Rack travel in mm: 5.0 Testing: Speed rpm : 100 Minimum rack trave: 7.50 Speed rpm Rack travel in mm : 4.90...5.10 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 14.00...14.10 2nd speed rpm : 600 Rack travel in m: 14.00...14.10 3rd speed rpm : 800 Rack travel in m: 14.00...14.10

Aneroid/Alti Compensator			
1st version Setting Speed Pressure Rack travel	rpm hPa mm	:	500 150 9.509.60
Measurement Speed	1/min	:	500
1-+	. hD=		

1st pressure hPa : -Rack travel in m: 9.20...9.30 2nd pressure hPa : 700 Rack travel in m: 12.80...13.10 3rd pressure hPa : 1100 Rack travel in m: 14.00...14.10

#### FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: Speed rpm : Del.quantity cm3/:	600
1000 s: Spread cm3:	(159.5167.5) 5.00
1000 s: Aneroid pressure h: Speed rpm :	1100 800
Del.quantity cm3/: 1000 s:	161.0164.0 (158.5166.5)
Aneroid pressure h: Speed rpm : Del.quantity cm3/: 1000 s:	500 67.069.0 (65.071.0)

#### **BRFAKAWAY**

1st version 1mm rack travel less than					
full Speed				13.00 1075	.1090

# STARTING FUEL DELIVERY

Speed			
Del.quanti	ity cm3/	:	80.0100.0
•	1000 s	:	(77.0103.0)

#### LOW IDLE

Speed	rpm :	250
Rack travel	.in mm :	4.905.10
Del.quantit	cy cm3/:	13.017.0
,	1000 s:	(10.519.5)
Spread	cm3 :	3.50
•	1000 s:	(5.50)

## Remarks:

: MAN #3-7127

Start-of-delivery mark is at start of delivery of cylinder 1

Note remarks

: MAN 7,3 D : 27.05.91 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 456 115

Injection pump

Pump designation : PES6MW100/321RS1215

: 0 413 406 205 EP type number

Governor

Governor design. : RQ250/1200MW84-7 : 0 420 082 055 Governer no.

Customer-spec. information Customer

: D 0826 LUH 01 Engine

: 199.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 Prestroke mm : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in nm : 13.60...13.70

Del.quantity cm3/: 16.3...16.5

100 s: (16.1...16.7)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 6.2...6.4

Del.quantity cm3/: 1.9...2.3 100 s: (1.6...2.5)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1320 1st speed 9.30...9.70 travel mm

: 1255 2nd speed rpm

6.50...6.70 travel mm

3rd speed

rpm : 360 : 3.90...4.50 travel mm

4th speed : 250 rpm

: 1.60...2.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: 107

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 103.0...167.0)

: 3.50

1000 : (6.00)

RATED SPEED 1st version Control Lever position degrees: 94...102 Setting point: Speed rpm Rack travel in mm: 20.0 Testing: 1st rack travel in: 12.60 rpm : 1245...1260 Speed 2nd rack travel in: 4.00 : 1300...1330 Speed rom 4th rack travel in: 1400 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 32...40 Setting point w/out bumper spring : 250 rpm Rack travel in mm: 6.3 Testina: Speed rpm : 150 Minimum rack trave: 8.00 : 250 rpm Rack travel in mm : 6.20...6.40 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 220 Pressure Rack travel mm : 10.30...10.40 Measurement 1/min: 500 Speed 1st pressure hPa :-Rack travel in m: 10.00...10.10 2nd pressure hPa : 750 Rack travel in m: 12.60...12.90 3rd pressure hPa : 1200 Rack travel in m: 13.60...13.70

FUEL DELIVERY CHARACTERISTICS

Speed rpm : 600 Del.quantity cm3/ : 167.0...170.0 1000 s: (164.5...172.5)

Aneroid pressure h: 1200

Spread cm3 : 5.00 1000 s: (7.0) Aneroid pressure h: 1200 : 800 Speed rpm Del.quantity cm3/: 163.0...166.0 1000 s: (160.5...168.5) Aneroid pressure h: 1200 Speed rpm : 1200 Del.quantity cm3/ : 160.0...163.0 1000 s: (157.5...165.5) Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 77.0...79.0
1000 s: (75.0...81.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.60 Speed rpm : 1245...1260 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 70.0...90.0 1000 s: (67.0...93.0) LOW IDLE : 250 Speed rpm Rack travel in mm : 6.20...6.40 Del.quantity cm3/: 19.0...23.0 1000 s: (16.5...25.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks: : MAN #3-7126 Start-of-delivery mark is at start of delivery of cylinder 1

1st version

Note remarks

Test sheet : MAN 7,3 D 1 Edition : 03.06.91

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 456 116

Injection pump

Pump designation : PES6MW100/321RS1215

EP type number : 0 413 406 205

Governor

Governor design. : RQ250/1200MW84-7 Governor no. : 0 420 082 055

Customer—spec. information Customer : MAN

Engine : D 0826 LUH 04

1st version kW : 199.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening 1

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 16.3...16.5

100 s: (16.1...16.7)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 6.2...6.4 Del.quantity cm3/ : 2.1...2.5 100 s: (1.8...2.7)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1320 travel mm : 9.30...9.70

2nd speed rpm : 1255 travel mm : 6.50...6.70

3rd speed rpm : 360

travel mm : 3.90...4.50 4th speed rpm : 250

travel mm : 1.60...2.00

GUIDE SLEEVE POSITION Control-lever position

Degree: 107

Speed rpm: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1000 Aneroid pressure h: 1200

Del.quantity : 163.0...165.0 1000 : (161.0...167.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 94...102

Setting point:

Speed : 600 rpm Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.60

rpm : 1245...1260 Speed

2nd rack travel in: 4.00

Speed rpm : 1300...1330 4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 32...40

Setting point w/out bumper spring

rpm : 250

Rack travel in mm: 6.3

Testing:

Speed rpm : 150

Minimum rack trave: 8.00

Speed rpm : 250 Rack travel in mm : 6.20...6.40

Aneroid/Altitude

Compensator Test

1st version

Settina

: 500 Speed rpm Pressure

hPa : 220 : 10.30...10.40 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.00...10.10

2nd pressure hPa : 750

Rack travel in m: 12.60...12.90

3rd pressure hPa : 1200

Rack travel in m: 13.60...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 600 rpm Speed

Del.quantity cm3/: 167.0...170.0 1000 s: (164.5...172.5)

Spread cm3 : 5.001000 s: (7.0)

Aneroid pressure h: 1200

Speed rpm: 800
Del.quantity cm3/: 163.0...166.0
1000 s: (160.5...168.5)

Aneroid pressure h: 1200

Speed rpm : 1200 Del.quantity cm3/ : 160.0...163.0 1000 s: (157.5...165.5)

Aneroid pressure h: -

rpm\_ : 500 Speed

Del.quantity cm3/: 77.0...79.0 1000 s: (75.0...81.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 1245...1260 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 70.0...90.0 1000 s: (67.0...93.0)

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 6.20...6.40 Del.quantity cm3/: 21.0...25.0

1000 s: (18.5...27.5) cm3 : 3.50 1000 s: (5.50) Spread

Remarks:

: MAN #3-7137

Start-of-delivery mark is at start of

delivery of cylinder 1

Note remarks

: LIE 5,6 B : 03.06.91 Test sheet Edition : 14.07.89 Replaces Test oil : ISO-4113

Combination no. : 0 403 474 008

Injection pump

Pump designation : PES4MW100/720RS1181

: 0 413 404 107 EP type number

Governor

Governor design. : RSV400...1000MW1A333 Governor no. : 0 420 085 118

Customer-spec. information : LIEBHERR Customer

: 914 Engine

: 120.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 049

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.00...3.10 : (2.95...3.15) Prestroke mm

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 10001st speed

Rack travel in mm : 11.70...11.80

Del.guantity cm3/: 14.6...14.8

100 s: (14.4...15.0)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 1.4...1.8

100 s: (1.1...2.0)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 3.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed

: 146.0...148.0 Del.quantity 1000 : (144.0...150.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 46...54

Setting point:

Speed Rack travel in mm: 0.6

Testing:

1st rack travel in: 10.70 Speed rpm: 1040...1050 2nd rack travel in: 4.00 rpm : 1070...1100 Speed 4th rack travel in: 1275 Speed rpm : 0.30...1.70LOW IDLE 1 Control lever position degrees: 17...25 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.2 Testing: : 100 Speed rpm Minimum rack trave: 19.00 rpm : 400 Speed Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00 Speed rpm : 480...540 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.70...11.80 2nd speed rpm : 600 Rack travel in m: 11.70...11.80 5th speed rpm : 400 Rack travel in m: 13.20...13.30 FUEL DELIVERY CHARACTERISTICS 1st version : 600 Speed rpm Del.quantity cm3/: 145.5...148.5 1000 s: (143.0...151.0) cm3 : 3.50 Spread 1000 s: (7.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1040...1050 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0) Rack travel in mm : 19.00...21.00

Speed rpm : 400
Rack travel in mm : 5.60...5.80
Del.quantity cm3/ : 14.0...18.0
1000 s: (11.5...20.5)
Spread cm3 : 3.50
1000 s: (5.00)

Remarks:

:

LOW IDLE

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : LIE 8,4 E Edition : 03.06.91 Replaces : 05.11.90 Test oil : ISO-4113 Combination no. : 0 403 474 012 Injection pump Pump designation : PES4MW100/720531207 EP type number : 0 413 404 113 Governor Governor design. : RSV350...1000MW0A333 : 0 420 085 153 Governer no. Customer-spec. information : LIEBHERR Customer : D 914 T Engine : 110.0 1st version kW : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 049 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Openina pressure, bar : 172...175 : 1 680 750 008 Test lines Outside diameter x Wall thickness : 6.00X2.00X600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY

Firing order : 1-3-4-2 Phasing : 0-90-180-270 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 11.50...11.60 Del.quantity cm3/: 13.3...13.5 100 s: (13.1...13.7) cm3 : 0.3Spread 100 s: (0.6) rpm : 350.02nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.4...1.8 100 s: (1.1...2.0) cm3 : 0.3Spread 100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...1.00 Governor spring pre-tension Click setting x : 5.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 : 133.0...135.0 1000 : (131.0...137.0) cm3 : 3.50 Del.quantity Spread 1000 : (6.00) RATED SPEED 1st version Control Lever position degrees: 96...104 Setting point: rpm Speed Rack travel in mm: 0.6

Rack travel in mm : 9.00...12.00

Prestroke mm

Test pressure, bar: 30...32

: 3.30...3.40

: (3.25...3.45)

Testing: 1st rack travel in: 10.50 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1110...1140 Speed 4th rack travel in: 1275 rpm : 0.30...1.70 Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 6.0 Testina: rpm : 100 Speed Minimum rack trave: 19.00 rpm : 350 Speed Rack travel in mm: 5.90...6.10 Rack travel in mm: 2.00 Speed rpm: 390...450 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 11.50...11.60 2nd speed rpm : 700 Rack travel in m: 11.50...11.60 d speed rpm : 500 3rd speed Rack travel in m: 11.50...11.60 rpm : 400 5th speed Rack travel in m: 13.00...13.10 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 700 Del.quantity cm3/ : 132.0...135.0 1000 s: (129.5...137.5) cm3 : 3.50Spread 1000 s: (7.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.50 rpm : 1040...1050 Speed STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0) Rack travel in mm : 19.50...21.00

LOW IDLE

Speed : 350 rpm Rack travel in mm : 6.40...6.60 Del.quantity cm3/: 14.0...18.0 1000 s: (11.5...20.5) cm3 : 3.50 1000 s: (5.00)

Spread

Remarks:

D01

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : LIE 8,4 D : 03.06.91 Test sheet Edition : 18.02.91 Replaces : ISO-4113 Test oil Combination no. : 0 403 476 081 Injection pump Pump designation : PES6MW100/720RS1196 EP type number : 0 413 406 184 Governor Governor design. : RSV350...1050MW0A338 : 0 420 085 138 Governer no. Customer-spec. information Customer : LIEBHERR Engine : D 916 T : 170.0 1st version kW : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil : 38...42 inlet temp. °C Overflow valve : 1 417 413 049 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test Lines : 1 680 750 008 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32 : 3.40...3.50 Prestroke mm : (3.35...3.55)

: 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1050 Rack travel in mm : 11.10...11.20 Del.guantity cm3/: 13.3...13.5 100 s: (13.1...13.7) cm3 : 0.3Spread 100 s: (0.6) 2nd speed rpm : 425.0 Rack travel in mm: 4.8...5.2 Del.quantity cm3/: 1.4...1.8 100 s: (1.1...2.0) Spread cm3 : 0.3100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -3 Speed rpm : 800 Rack travel in mm : 0.30...1.00 Governor spring pre-tension Click setting x : 5.00FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1050 Speed Aneroid pressure h: 750 : 133.0...135.0 Del.quantity 1000 : (131.0...137.0) : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 98...106 Setting point: : 800 Speed rpm Rack travel in mm: 0.6 Testing: 1st rack travel in: 10.10

Rack travel in mm : 9.00...12.00

: 1070...1080 Speed rpm 2nd rack travel in: 4.00 Speed rpm : 1115...1145 4th rack travel in: 1200 rpm : 0.30...1.70 Speed LOW IDLE 1 Control lever position degrees: 68...76 Setting point w/out bumper spring rpm : 425 Rack travel in mm: 4.5 Testing: Speed : 100 rpm Minimum rack trave: 19.00 : 425 Speed rpm Rack travel in mm : 4.30...4.70 TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1050 Rack travel in m: 11.10...11.20 1st speed 2nd speed : 500 rpm Rack travel in m: 11.10...11.20 3rd speed rpm : 800 Rack travel in m: 11.10...11.20 5th speed rpm : 400 Rack travel in m: 12.60...12.70 Aneroid/Altitude Compensator Test 1st version Settina : 550 Speed rpm Pressure hPa Rack travel mm : 10.70...10.80 Measurement Speed  $1/\min : 550$ 1st pressure hPa : 200 Rack travel in m: 10.90...11.00 2nd pressure hPa : 750 Rack travel in m: 11.10...11.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 750 rpm : 500 Speed Del.quantity cm3/: 125.0...128.0 1000 s: (122.5...130.5) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: 750 Speed rpm

Del.quantity cm3/: 132.0...135.0 1000 s: (129.5...137.5) Aneroid pressure h: -Speed rpm : 550 Del.quantity cm3/ : 120.0...122.0 1000 s: (118.0...124.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.10 Speed rpm : 1070...1080 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm : 19.50...21.00 LOW IDLE : 425 Speed rpm Rack travel in mm : 4.80...5.20 Del.quantity cm3/: 14.0...18.0 1000 s: (11.5...20.5) cm3 : 3.50 1000 s: (5.00) Spread

Remarks:

Starting/full-load transition speed from holding magnet = 500 1/min.

Idle adjustment at 425 min-1

Note remarks

Test sheet : MB 6,1 D 5 : 26.04.91 Edition : 22.03.91 Replaces

Test oil : ISO-4113

Combination no. : 0 403 476 103

Injection pump

Pump designation : PES6MW100/720RS1131

: 0 413 406 123 EP type number

Governor

: RSV350...1200MW0A342 Governor design.

: 0 420 085 169 Governer no.

Customer—spec. information : MB-NFZ Customer

: OM 366 A Engine

: 92.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 10.10...10.20

Del.quantity cm3/: 6.4...6.6

100 s: (6.2...6.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.0 2nd speed

Rack travel in mm : 6.2...6.9 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5)

cm3 : 0.3 Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm: 0.30...1.00

Governor spring pre-tension

Click setting x : 5.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200Aneroid pressure h: 750

: 64.0...66.0 Del.quantity 1000 : (62.0...68.0) cm3 : 3.50

Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 94...102

Setting point:

rpm : 800 Speed Rack travel in mm: 0.6

Testing:

1st rack travel in: 9.10 rpm : 1235...1240 \* Speed 2nd rack travel in: 4.00 Speed rpm: 1270...1283
3rd rack travel in: 4.00
Speed rpm: 1300...1330
4th rack travel in: 1450 Speed rpm : 0.30...1.705th rack travel in: 1245...1265 rpm : 9.10 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm Rack travel in mm: 6.5 Testing: Speed rpm : 100 Minimum rack trave: 19.00 : 350 Speed rpm Rack travel in mm : 6.20...6.90 Rack travel in mm : 2.00 : 440...500 Speed rpm TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 10.10...10.20 rpm : 600 2nd speed Rack travel in m: 10.90...11.00 3rd speed rpm : 1000 Rack travel in m: 10.40...10.60 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 180 Pressure : 10.50...10.70 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.30...10.40 3rd pressure hPa : 750 Rack travel in m: 10.90...11.00 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 750 rpm : 600 Speed Del.quantity cm3/: 58.0...61.0 1000 s: (55.5...63.5)

Spread cm3: 5.00 1000 s: (7.0) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 47.0...49.0 1000 s: (45.0...51.0)

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 9.10 Speed rpm : 1235...1240

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 83.0...93.0 1000 s: (80.0...96.0)

LOW IDLE

Speed rpm : 350
Rack travel in mm : 6.20...6.90
Del.quantity cm3/: 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

\* Read off speed set under 1. Add 35...43 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Test hydr. locking device for starting with 500...1000 hPa air pressure.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

Note remarks

Test sheet : MB 6,1 D 6 : 03.05.91 Edition Replaces : 22.03.91 Test oil : ISO-4113

: 0 403 476 104 Combination no.

Injection pump

Pump designation : PES6MW100/720RS1131

: 0 413 406 123 EP type number

Governor

Governor design. : RSV350...1200MW0A342

: 0 420 085 170 Governer no.

Customer-spec. information Customer : MB-NFZ

: OM 366 A Engine

: 100.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm : 12001st speed

Rack travel in mm : 10.50...10.60

Del.guantity cm3/: 7.4...7.6

100 s: (7.2...7.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.02nd speed Rack travel in mm : 5.8...6.5

Del.quantity cm3/: 0.9...1.3 100 s: (0.6...1.5)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1200 Speed Aneroid pressure h: 750

: 74.0...76.0 Del.quantity 1000 : (72.0...78.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800 Rack travel in mm : 0.6

Testing:

D06

1st rack travel in: 9.50 rpm : 1240...1245 \* Speed 2nd rack travel in: 4.00 : 1280...1293 Speed rom 3rd rack travel in: 4.00 Speed rpm: 1300...1330 4th rack travel in: 1450 rpm : 0.30...1.70Speed 5th rack travel in: 1240...1255 rpm : 9.50Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm Rack travel in mm: 6.1 Testing: Speed : 100 rpm Minimum rack trave: 19.00 : 350 rpm Rack travel in mm : 5.80...6.50 Rack travel in mm : 2.00 Speed : 450...530 rpm TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version rpm : 1200 1st speed Rack travel in m: 10.50...10.60 2nd speed rpm : 600 Rack travel in m: 11.30...11.40

3rd speed rpm : 1000

Rack travel in m: 10.90...11.10 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 250 Speed rpm Pressure Rack travel mm : 10.60...10.80 Measurement Speed 1/min: 500 1st pressure hPa : -Rack travel in m: 10.00...10.10
2nd pressure hPa : 300
Rack travel in m: 10.90...11.10
3rd pressure hPa : 750 Rack travel in m: 11.30...11.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 750 Speed rpm : 600

D07

Del.quantity cm3/: 67.0...70.0 1000 s: (64.5...72.5) cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 47.0...49.0 1000 s: (45.0...51.0)

#### BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.50 rpm : 1240...1245 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm Del.quantity cm3/: 83.0...93.0 1000 s: (80.0...96.0)

#### LOW IDLE

rpm : 350 Speed Rack travel in mm : 5.80...6.50 Del.quantity cm3/: 9.0...13.0 1000 s: (6.5...15.5) Spread cm3 : 3.50 1000 s: (5.50)

#### Remarks:

\* Read off speed set under 1. Add 40...48 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Test hydr. Locking device for starting with 500...1000 hPa air pressure.

Set pneumatic shutoff\_device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

Note remarks

Test sheet : MB 6,1 D 7 : 26.04.91 Edition : 22.0391 Replaces : ISO-4113 Test oil

: 0 403 476 105 Combination no.

Injection pump

Pump designation : PES6MW100/720RS1131

: 0 413 406 123 EP type number

Governor

Governor design. : RSV350...1200MWOA342

-8

: 0 420 085 171 Governer no.

Customer-spec. information Customer : MB-NFZ

: 0M 366 A Engine

: 114.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.70...3.80 : (3.65...3.85) Prestroke mm

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 8.4...8.6

100 s: (8.2...8.8)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 5.3...6.0 Del.quantity cm3/: 0.9...1.3

100 s: (0.6...1.5) Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1200 Aneroid pressure h: 750

: 84.0...86.0 Del.quantity 1000 : (82.0...88.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 100...108

Setting point:

Speed rpm : 800 Rack travel in mm: 0.6

Testing:

1st rack travel in: 9.90 rpm : 1240...1245 \* Speed 2nd rack travel in: 4.00 rpm : 1285...1293 Speed 3rd rack travel in: 4.00 rpm : 1325...1355 Speed 4th rack travel in: 1450 rpm : 0.30...1.70Speed 5th rack travel in: 1240...1255 Speed rpm : 9.90 LOW IDLE 1 Setting point w/out bumper spring Speed rom Rack travel in mm: 5.6 Testing: Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm: 350 Rack travel in mm: 5.30...6.00 Rack travel in mm: 2.00 rpm : 420...500 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 10.90...11.00 2nd speed rpm : 600 Rack travel in m: 11.70...11.80 3rd speed rpm : 1000 Rack travel in m: 11.00...11.20 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 300 Speed rom Pressure : 10.70...10.90 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 9.60...9.70 2nd pressure hPa : 400 Rack travel in m: 11.30...11.50 3rd pressure hPa : 750 Rack travel in m: 11.70...11.80 FUEL DELIVERY CHARACTERISTICS 1st version

Del.quantity cm3/: 78.0...81.0 1000 s: (75.5...83.5) Spread cm3 : 5.00 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 47.0...49.0 1000 s: (45.0...51.0)

#### **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 9.90 Speed rpm : 1240...1245

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 83.0...93.0 1000 s: (80.0...96.0)

### LOW IDLE

Speed rpm: 350
Rack travel in mm: 5.30...6.00
Del.quantity cm3/: 9.0...13.0
1000 s: (6.5...15.5)
Spread cm3: 3.50
1000 s: (5.50)

#### Remarks:

\* Read off speed set under 1. Add 45...53 min-1 to this speed. The control-rod travel under 2. must be attained with the calculated speed profile.

Test hydr. locking device for starting with 500...1000 hPa air pressure.

Set pneumatic shutoff device to control-rod stop = 0.5...1.5 mm control-rod travel at 4.5 bar atmospheric pressure.

Speed

Aneroid pressure h: 750

rpm : 600

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : IHC 7,7, B : 26.04.91 Test sheet Edition : 19.03.91 Replaces Test oil : ISO-4113 Combination no. : 0 403 476 106 Injection pump Pump designation : PES6MW100/320RS1213 EP type number : 0 413 406 203 Governor Governor design. : RSV350...750MW7A345 : 0 420 085 168 Governer no. Customer-spec. information Customer : NAVISTAR Engine : DT-466 : 159.0 1st version kW : 1500 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 038 Inlet press., bar: 2.80 Test nozzle holder : 1 688 901 101 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,6 : 1 680 750 008 Test lines Outside diameter x Wall thickness : 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32 D10

Prestroke mm : 3.25...3.35 : (3.20...3.40)
Rack travel in mm : 9.00...12.00
Firing order : 1-5-3-6-2-4 : 0-60-120-180-240-300 Phasina Tolerance + - ° : 0.50 (0.75) BASIC SETTING fst speed rpm: 700 Rack travel in mm : 14.20...14.30 Del.quantity cm3/: 16.2...16.4 100 s: (16.0...16.6) Spread cm3 : 0.3100 s: (0.6) 2nd speed rpm : 350.0Rack travel in mm: 4.7...4.9 Del.quantity cm3/: 0.8..1.2 100 s: (0.5...1.4) Spread cm3: 0.3 100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -3 Speed rpm: 800 Rack travel in mm: 0.30...1.00 Governor spring pre-tension Click setting x : 5.00FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 : 162.5...164.5 Del.quantity : (160.5...166.5) 1000 : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 90...98

Setting point:

: 800 Speed rpm Rack travel in mm: 0.6

Testing: 1st rack travel in: 13.20 Speed rpm: 750...760 2nd rack travel in: 4.00 Speed rpm: 795...805 3rd rack travel in: 4.00 Speed rpm : 800...810 4th rack travel in: 850 rpm : 0.30...1.70Speed LOW TDLE 1 Control Lever position degrees: 68...76 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm : 4.8 Testing: : 100 Speed rpm Minimum rack trave: 19.00 Speed rpm : 350 Rack travel in mm : 4.70...4.90 BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 750...760 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 160.0...180.0 1000 s: (155.0...185.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 4.70...4.90 Del.quantity cm3/: 8.0...12.0 1000 s: (5.5...14.5) Spread cm3 : 3.50 1000 s: (5.00) Remarks:

Note remarks

Test sheet : PEN 6,1 Q 1 : 26.04.91 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 476 108

Injection pump

Pump designation : PES6MW100/320RS1132

EP type number : 0 413 406 124

Governor

: RSV325...1400MW2A314 Governor design.

-3

: 0 420 085 173 Governer no.

Customer-spec. information : PENTA Customer

Engine : TD 610M

1st version kW : 147.0 : 2800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina .

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 2.00x6.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.90...3.00 Prestroke mm

: (2.85...3.05)

Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 325.0 2nd speed Rack travel in mm : 6.0...6.1 Del.quantity cm3/: 1.2...1.6

100 s: (0.9...1.8)

Spread cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 900

Del.quantity : 96.0...70.0 1000 : (94.0...100.0) cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 54...62

Setting point:

Speed rpm Rack travel in mm: 0.6

Testing:

1st rack travel in: 10.30

rpm : 1440...1450 Speed

2nd rack travel in: 4.00

rpm : 1520...1540 Speed 4th rack travel in: 1650 Speed rpm : 0.30...1.70 LOW IDLE 1 Control Lever position degrees: 18...26 Setting point w/out bumper spring rpm : 325 Rack travel in mm: 5.5 Testing: : 100 Speed rpm Minimum rack trave: 19.00 : 325 rpm Speed Rack travel in mm : 5.50...5.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1000 man Pressure hPa:-: 10.00...10.10 Rack travel mm

Measurement
Speed 1/min: 1000

1st pressure hPa: 130
Rack travel in m: 10.20...10.30
2nd pressure hPa: 420
Rack travel in m: 10.90...11.20
3rd pressure hPa: 900
Rack travel in m: 11.30...11.40

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: Speed rpm : 1000
Del.quantity cm3/ : 78.0...80.0

1000 s: (76.0...82.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.30 Speed rpm : 1440...1450

STARTING FUEL DELIVERY

Speed rpm: 100

Del.quantity cm3/: 140.0...160.0 1000 s: (137.0...163.0) Rack travel in mm: 19.00...21.00

LOW IDLE

Speed rpm : 325
Rack travel in mm : 6.00...6.10
Del.quantity cm3/ : 12.0...16.0
1000 s: (9.5...18.5)
Spread cm3 : 3.50

pread cm3 : 3.50 1000 s: (5.50)

Remarks:

D13

Note remarks

: MB 8,7 Q 1 : 27.05.91 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 546 008

Injection pump

Pump designation : PE6MW100/720RS1177

EP type number : 0 413 506 107

Governor

Governor design. : RQ300/1250MW12-2 : 0 420 082 020 Governer no.

Customer-spec. information Customer : MB-NFZ

Engine : 0M360A

: 147.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.80...3.90 Prestroke mm : (3.75...3.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

Firing order

rpm: 1250 1st speed

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 9.7...9.9

100 s: (9.5...10.1)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 8.4...8.6 Del.quantity cm3/ : 1.0...1.4 100 s: (0.7...1.6)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 650

Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

: 97.0...99.0 Del quantity 1000 : (95.0...101.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 42...50

Setting point:

Speed rpm : 650

Rack travel in mm : 13.5

Testing:

1st rack travel in: 11.90

rpm : 1295...1310 Speed

2nd rack travel in: 4.00

rpm : 1415...1445 Speed

4th rack travel in: 1550

D14

: 0.10...1.00 Speed rpm LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 8.5 Testing: Speed rpm: 220
Minimum rack trave: 10.40
Speed rpm: 300
Rack travel in mm: 8.40...8.60
Rack travel in mm: 2.00 Speed rpm : 430...470 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 750 Del.quantity cm3/: 95.0...98.0 1000 s: (92.5...100.5) Spread cm3: 5.00 1000 s: (7.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.90 rpm : 1295...1310 Speed STARTING FUEL DELIVERY Speed rpm: 100 Del.quantity\_cm3/: 80.0...90.0 1000 s: (77.0...93.0) LOW IDLE rpm : 300 Speed Rack travel in mm : 8.40...8.60 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5) Spread cm3 : 3.50 1000 s: (5.50) Remarks: :

Note remarks

: BAO 13,2 B Test sheet : 27.05.91 Edition : 04.11.88 Replaces Test oil : ISO-4113

Combination no. : 0 403 546 018

Injection pump

Pump designation: PE6MW100/320RS1174

EP type number : 0 413 506 106

Governor

Governor design. : RQV325...1500MW100

: 0 420 083 166 Governer no.

Customer-spec. information Customer : BAUDOUIN

: 6 F 11 SRE Engine

: 225.0 1st version kW : 3000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.00...3.10 Prestroke mm

: (2.95...3.15) Rack travel in mm : 9.00...12.00

: 1-4-3-6-5-2 Firing order

: 0-75-120-195-240-315 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1500

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 12.9...13.1

100 s: (12.7...13.3)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 325.0 Rack travel in mm : 6.9...7.1 Del.quantity cm3/ : 0.8...1.2 100 s: (0.5...1.4)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1650 1st speed

: 9.40...9.80 rpm : 1550 travel mm

2nd speed

travel mm : 8.50...8.70

rpm : 600 3rd speed

: 2.50...3.10 travel mm

: 325 4th speed rpm

: 1.00...1.40 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1500 Speed

: 129.0...131.0 Del.quantity

1000 : (127.0...133.0)

: 3.50 Spread cm3

1000 : (6,00)

RATED SPEED

1st version

Control lever

position degrees: 50...58

Testing:

1st rack travel in: 10.50

rpm : 1540...1550 Speed

2nd rack travel in: 4.00 Speed rpm : 1635...1665 4th rack travel in: 1750 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 16...24 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 7.0 Testing: Speed rpm : 100 Minimum rack trave: 8.50 rpm : 325 Speed Rack travel in mm : 6.90...7.10 START CUT-OUT Speed 1/min: 230 (250) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.50 Speed rpm : 1540...1550 STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 105.0...115.0 1000 s: (102.0...118.0)

#### LOW IDLE

Speed rpm: 325 Rack travel in mm: 6.90...7.10 Del.quantity cm3/: 8.0...12.0

1000 s: (5.5...14.5)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

Note remarks

: BAO 13,2 B1 : 17.05.91 Test sheet Edition Replaces : 07.02.89 Test oil : ISO-4113

Combination no. : 0 403 546 019

Injection pump

Pump designation : PE6MW100/320RS1174

EP type number : 0 413 506 106

Governor

Governor design. : RQV325...1500MW101

: 0 420 083 167 Governer no.

Customer-spec. information Customer : BAUDOUIN

: 6 F 11 SRE Engine

: 206.0 1st version kW Rated speed : 3000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.00...3.10 Prestroke mm : (2.95...3.15) Rack travel in mm : 9.00...12.00

Firing order : 1-4-3-6-5-2

Phasing : 0-75-120-195-240-315

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm : 1500

Rack travel in mm : 11.10...11.20

Del.guantity cm3/: 11.9...12.1

100 s: (11.7...12.3)

Spread cm3 : 0.3

100 s: (0.6)

rpm : <u>3</u>25.0 2nd speed Rack travel in mm: 7.0...7.2 Del.quantity cm3/: 0.8...1.2

100 s: (0.5...1.4)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1650 1st speed : 9.40...9.80 travel mm

rpm : 1550 2nd speed : 8.50...8.70 travel mm

3rd speed : 600 rpm

: 2.50...3.10 : 325 travel mm

4th speed rpm

: 1.00...1.40 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Aneroid pressure h: 700 : 119.0...121.0 Del.quantity

1000 : (117.0...123.0)

cm3 : 3.50 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 52...60

Testina:

1st rack travel in: 10.10

D18

rpm : 1540...1550 Speed 2nd rack travel in: 4.00 rpm : 1625...1655 Speed 4th rack travel in: 1750 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 18...26 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 7.1 Testing: : 100 Speed rpm Minimum rack trave: 8.50 : 325 Speed rpm Rack travel in mm : 7.00...7.20 TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1500
Rack travel in m: 11.10...11.20
nd speed rpm : 800
Rack travel in m: 11.90...12.00 1st speed 2nd speed 3rd speed rpm : 1000 Rack travel in m: 11.30...11.50 Aneroid/Altitude Compensator Test 1st version Settina rpm : 500 hPa : 500 mm : 11.30...11.40 Speed rpm Pressure Rack travel mm Measurement  $1/\min : 500$ Speed 1st pressure hPa : 700 Rack travel in m: 11.90...12.00 2nd pressure hPa : 600 Rack travel in m: 11.50...11.60 START CUT-OUT 1/min : 230 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed rpm : 800 Del.quantity cm3/: 128.5...131.5 1000 s: (126.0...134.0) Spread cm3: 5.00

1000 s: (7,0)

LOW IDLE

Remarks:

:

Note remarks

Test sheet : STE 6,5 F Edition : 26.04.91

Replaces : -

Test oil : ISO-4113

Combination no. : 0 403 546 020

Injection pump

Pump designation : PE6MW100/720RS1157

EP type number : 0 413 506 103

Governor

Governor design. : RQ250/1200MW94-2 Governor no. : 0 420 082 047

Customer—spec. information Customer : SNF

Engine : WD 612.66

1st version kW : 165.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10 : (2.95...3.15)
Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance  $+ - \circ : 0.50 (0.75)$ 

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 13.50...13.60

Del.quantity cm3/: 13.1...13.3

100 s: (12.9...13.5)

Spread cm3: 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm : 5.8...6.0 Del.quantity cm3/ : 1.2...1.6 100 s: (0.9...1.8)

Spread cm3: 0.3

100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.00...9.40 2nd speed rpm : 1250

travel mm : 6.20...6.40

3rd speed rpm : 375 travel mm : 3.30...3.90

4th speed rpm : 250 ... ...

travel mm : 1.00...1.40

GUIDE SLEEVE POSITION Control-lever position

Degree: 107

peed rpm: 800

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1200 Aneroid pressure h: 900

Del.quantity : 131.0...133.0

1000 : (129.0...135.0) cm3 : 3.50

Spread cm3 : 3.50 1000 : (6.00)

EU

RATED SPEED

1st version Control lever position degrees: 94...102 Setting point: Speed rom Rack travel in mm: 20.0 Testing: 1st rack travel in: 12.50 rpm : 1235...1250 Speed 2nd rack travel in: 4.00 rpm : 1300...1330 Speed 4th rack travel in: 1400 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 68...76 Setting point w/out bumper spring speed rpm : 250 Rack travel in mm : 5.9 Testing: Speed man : 150 Minimum rack trave: 7.50 rpm Rack travel in mm : 5.80...6.00 CONSTANT REGULATION rpm : 260...400 Speed Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 400 Pressure Rack travel mm : 11.50...11.60 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 11.00...11.10 2nd pressure hPa : 660 Rack travel in m: 12.90...13.20 3rd pressure hPa : 900 Rack travel in m: 13.50...13.60 START CUT-OUT Speed 1/min: 190 (210) FUEL DELIVERY CHARACTERISTICS 1st version

Aneroid pressure h: 900 Speed rpm : 700 Del.quantity cm3/: 130.5...134.5 1000 s: (128.5...136.5) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 79.5...81.5 1000 s: (77.5...83.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.50 rpm : 1235...1250 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 130.0...140.0 1000 s: (127.0...143.0) LOW IDLE

Remarks:

.

D21

Note remarks

: KHD 13,4 D : 17.05.91 Test sheet Edition : 02.05.90 Replaces : ISO-4113 Test oil

Combination no. : 0 403 548 037

Injection pump

Pump designation : PE8MW100/720LS1128 : 0 413 508 103 EP type number

Governor

Governor design. : RQV450...1150MW70-2

: 0 420 083 211 Governer no.

Customer-spec. information Customer : KHD

: BF 8L 513 Engine

: 191.0 1st version kW Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

Test lines : 1 680 740 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20

: (3.05...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-3

Phasing : 0-45-90-135-180-225-

270-315

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 12.2...12.4

100 s: (12.0...12.6)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 450.02nd speed Rack travel in mm : 5.6...5.8 Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...1.9)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1200 travel mm : 9.30...9.40

rpm : 10002nd speed

: 6.20...6.40 travel mm

3rd speed rpm : 600

: 2.50...3.10 travel mm : 450

4th speed rpm

: 1.20...1.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1150 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

: 122.0...124.0 Del.quantity

1000 : (120.0...126.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SF. ED

1st version Control Lever position degrees: 118...126 Setting point: : 1150 Speed rpm Rack travel in mm: 16.5 Testing: 1st rack travel in: 10.30 Speed rpm : 1190...1200 2nd rack travel in: 4.00 Speed rpm : 1230...1260 4th rack travel in: 1320 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 80...88 Setting point w/out bumper spring Speed rpm : 450 Rack travel in mm : 5.7 Testing: : 100 Speed rpm Minimum rack trave: 7.50 Speed rpm : 450 Rack travel in mm : 5.60...5.80 START CUT-OUT 1/min: 350 (370) Speed **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.30 rpm : 1190...1200 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 140.0...150.0 1000 s: (137.0...153.0) LOW IDLE Speed rpm : 450 Rack travel in mm : 5.60...5.80 Del.quantity cm3/ : 13.0...17.0 1000 s: (10.5...19.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks:

Note remarks

Test sheet : MAN 11,9 t1 : 25.06.91 Edition : 18.1.91 Replaces : ISO-4113 Test oil

Combination no. : 0 402 736 809

Injection pump

Pump designation : PES6P120A720/3LS7209

: 0 412 726 837 EP type number

Governor

Governor design. : RQV300...1000PA960-2

: 0 421 815 249 Governer no.

Customer-spec. information Customer : MAN

: D2866LF06 Engine

: 309.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4,80...4.90

: (4.75...4.95) Rack travel in mm : 15.00...16.00

: 6-2-4-1-5-3 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no.

BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.50...13.60

Del.guantity cm3/: 28.5...28.7

100 s: (28.2...29.0)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm : 4.8...5.2 Del.quantity cm3/ : 2.0...2.6

100 s: (1.7...2.9) cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1045 1st speed

: 9.60...9.80 travel mm

2nd speed

rpm : 300 : 1.40...1.80 travel mm

: 500 3rd speed rpm

: 3.50...4.10 travel mm

4th speed : 900 rpm

: 7.70...8.10 travel mm

5th speed rpm : 1350

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1100 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

Aneroid pressure h: 1300 2nd pressure hPa : 220 Rack travel in m: 9.10...9.20 : 285.0...287.0 Del.quantity 1000 : (282.0...290.0) 3rd pressure hPa : 720 cm3 : 5.00 Rack travel in m: 11.40...11.60 Spread 1000 : (9.00) START CUT-OUT RATED SPEED Speed 1/min: 220 (240) 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 293...301 Testing: 1st version Aneroid pressure h: 1300 1st rack travel in: 12.10 Speed rpm : 1000 Del.quantity cm3/ : 261.0...265.0 1000 s: (258.0...268.0) rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1140...1170 Speed 4th rack travel in: 1300 Aneroid pressure h: 1300 Speed rpm : 750 Del.quantity cm3/ : 271.0...277.0 rpm : 0.00...1.00Speed 1000 s: (268.0...280.0) LOW IDLE 1 Control lever Aneroid pressure h: -: 500 position degrees: 247...255 Speed rpm Del.quantity cm3/: 166.0...168.0 1000 s: (163.0...171.0) Testina: Speed : 100 rpm Minimum rack trave: 6.50 rpm : 300 **BREAKAWAY** Rack travel in mm : 4.90...5.10 1st version CONSTANT REGULATION 1mm rack travel less than Speed rpm : 320...440 full load rack tr: 12.10 rpm : 1040...1050 TORQUE CONTROL Speed Dimension a mm Torque control curve - 1st version STARTING FUEL DELIVERY : 900 1st speed rom Rack travel in m: 13.50...13.60 rpm : 1000 2nd speed Speed rpm Del.quantity cm3/: 210.0...230.0 1000 s: (206.0...234.0) Rack travel in m: 13.00...13.20 3rd speed rpm : 750 Rack travel in m: 12.70...12.90 rpm : 400 LOW IDLE 4th speed Rack travel in m: 11.50...11.70 Speed rpm : 300 Rack travel in mm : 4.80...5.20 Aneroid/Altitude Del.quantity cm3/: 20.0...26.0 Compensator Test 1000 s: (17.0...29.0) cm3 : 8.00Spread 1000 s: (12.00) 1st version Setting : 900 Speed Remarks: rom hPa : 1300 : MAN-NR. 3-7052 Pressure Rack travel mm : 13.50...13.60 Setting and blocking of pointer of start-of-delivery sensor on cyl. 6 Measurement Speed 1/min: 900 start of delivery

1st pressure hPa : -

Rack travel in m: 8.80...9.00

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAC 12,0 e : 17.06.91 Test sheet Edition : 4.9.90 Replaces Test oil : ISO-4113 Combination no. : 0 402 746 885 Injection pump Pump designation : PES6P120A720RS7157 : 0 412 726 814 EP type number Governor Governor design. : RQV325...875PA944-3K : 0 421 815 238 Governer no. Customer-spec. information : MACK TRUCKS Customer : EM7-275 Engine : 205.0 1st version kW : 1750 Rated speed TEST BENCH REQUIREMENTS Test oil : 38...42 inlet temp. °C Overflow valve : 2 417 413 011 Overflow 1 4 1 quantity min. 1/h: 160...170 Test nozzle holder assembly : 1 688 901 101 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 17...19 D26

Prestroke mm : 2.75...2.85 : (2.70...2.90) Rack travel in mm : 10.50 : 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 875 Rack travel in mm : 11.40...11.50 Del.quantity cm3/: 19.2...19.4 100 s: (19.0...19.6) Spread cm3 : 0.5100 s: (0.9) rpm : 325.02nd speed Rack travel in mm : 4.7...4.9 Del.quantity cm3/: 4.0...4.6 100 s: (3.8...4.8) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1.20...1.40 travel mm 2nd speed : 450 rpm travel mm 2.80...3.20 3rd speed : 650 rpm 5.60...5.80 travel mm : 900 4th speed rpm : 8.30...8.50 travel mm 5th speed : 1100 rpm : 10.30...10.80 travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 875 Aneroid pressure h: 1200 : 192.0...194.0 Del quantity 1000 : (190.0...196.0) : 5.00 Spread cm3 1000 : (9.00)

RATED SPEED
1st version Control lever position degrees: 5462
Testing: 1st rack travel in: 10.40 Speed rpm : 915925 2nd rack travel in: 4.00 Speed rpm : 10251055 4th rack travel in: 1150 Speed rpm : 0.001.00
LOW IDLE 1 Control lever position degrees: 715
Testing: Speed rpm : 275 Minimum rack trave: 5.90 Speed rpm : 325 Rack travel in mm : 4.704.90
CONSTANT REGULATION Speed rpm : 325520
TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version 1st speed rpm : 875 Rack travel in m: 11.4011.50 2nd speed rpm : 510 Rack travel in m: 12.8013.00 3rd speed rpm : 600 Rack travel in m: 12.4012.80 4th speed rpm : 450 Rack travel in m: 0.0012.50
Aneroid/Altitude Compensator Test
1st version Setting Speed rpm : 510 Pressure hPa : 1200 Rack travel mm : 12.8013.00
Measurement Speed 1/min : 510
1st pressure hPa : - Rack travel in m: 8.008.40 2nd pressure hPa : 355 Rack travel in m: 9.409.50 3rd pressure hPa : 630 Rack travel in m: 11.5011.90
START CUT-OUT

```
1/min: 275 (285)
Speed
FUEL DELIVERY CHARACTERISTICS
1st version
Aneroid pressure h: 1200
Speed rpm : 510
Del.quantity cm3/: 268.0...274.0
1000 s: (266.0...276.0)
                cm3 : 8.00
Spread
              1000 s: (12.0)
Aneroid pressure h: 1200
Speed
                     : 850
              rpm
Del.quantity cm3/: 159.0...161.0 * 1000 s: (136.5...157.0)
Aneroid pressure h: -
Speed rpm : 400
Del.quantity cm3/: 157.5...161.5
1000 s: (155.5...163.5)
BREAKAWAY
1st version
1mm rack travel less than
 full load rack tr: 10.40
             rpm : 915...925
Speed
STARTING FUEL DELIVERY
                   : 100
Speed
              rpm
Del.quantity cm3/: 190.0...230.0
              1000 s: (180.0...240.0)
Rack travel in mm : 10.40...11.00
LOW IDLE
Speed rpm : 325
Rack travel in mm : 4.70...4.90
Del.quantity cm3/: 40.0...46.0
1000 s: (38.0...48.0)
Spread
               cm3 : 8.00
              1000 s: (12.00)
Remarks:
                     : MACK # 313GC5185-P22
* This test specification applies only
to the engine/nozzle-and-holder
assemblies on an injection-pump test
bench: setting for test equipment,
check value for engine equipment.
```

Bow dimension:

Sliding-sleeve position = 37.0 mm

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

: CUM 8,3 D15 : 05.07.91 Test sheet Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 403 436 109

Injection pump

Pump designation : PES6MW100/120RS1143

: 0 413 406 137 EP type number

Governor

Governor design. : RQV300...1050MW82-4

: 0 420 083 168 Governer no.

Customer-spec. information

Customer : CUMMINS/US

: 6 CTA-830 Engine

: 175.0 1st version kW

: 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.05...3.15

: (3.00...3.20)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12.60...12.70

Del.quantity cm3/: 14.8...15.0

100 s: (14.6...15.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm : 7.7...7.9

Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2)

cm3 : 0.3 Spread

100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1210

: 9.00...9.40 travel mm

rpm : 1100 2nd speed

travel mm : 7.90...8.10

3rd speed

rpm : 550 : 3.00...3.60 rpm : 300 travel mm

4th speed

: 1.10...1.50 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

Aneroid pressure h: 900

Del.quantity : 148.0...152.0)

cm3 : 3.50 Spread

1000 : (6.00)

RATED SPEED

1st version

Control lever position degrees: 42...50 Testing: 1st rack travel in: 11.60 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1185...1215 Speed 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 10...18 Setting point w/out bumper spring rpm : 300 Speed Rack travel in mm: 7.8 Testing: : 100 Speed rpm Minimum rack trave: 9.30 Speed rpm: 300 Rack travel in mm: 7.70...7.90 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -: 10.20...10.40 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 225 Rack travel in m: 10.90...11.00 2nd pressure hPa : 450 Rack travel in m: 11.90...12.30 3rd pressure hPa : 900 Rack travel in m: 12.60...12.70 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

Del.quantity cm3/: 88.5...90.5 1000 s: (86.5...92.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.60 rpm : 1090...1100 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 215.0...225.0 1000 s: (212.0...228.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 300 Rack travel in mm : 7.70...7.90 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) cm3 : 3.50Spread 1000 s: (5.50) Remarks: : CUM #3915581

Start-of-delivery mark/lock = 8.0° angular displacement of the cam after start of delivery of cylinder 1.

Note remarks

: MWM 6,2 G 1 Test sheet : 05.07.91 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 436 113

Injection pump

Pump designation : PES6MW100/320/3RS116

EP type number : 0 413 406 149

Governor

Governor design. : RQ300/1000MW117 : 0 420 082 057 Governer no.

Customer-spec. information : MWM Customer

: TBD226B-6 Engine

: 150.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 4.00...4.10 Prestroke mm

: (3.95...4.15)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 14.4...14.6

100 s: (14.2...14.8)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.1...1.5

100 s: (0.8...1.7)

Spread cm3 : 0.3 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1100 1st speed

: 7.30...7.70 rpm : 1000 travel mm 2nd speed

: 5.90...6.10 travel mm rpm : 370 3rd speed

: 4.70...5.30 travel mm rpm : 300 4th speed

: 1.20...1.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: 107

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1200

Del.quantity : 144.0...148.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever

position degrees: 91...99

Setting point:

: 600 Speed rpm Rack travel in mm: 20.0

Testing:

1st rack travel in: 11.40

rpm : 1040...1055 Speed

2nd rack travel in: 4.00

rpm : 1130...1160 Speed

4th rack travel in: 1200

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 28...36 Setting point w/out bumper spring

: 300 rpm Rack travel in mm: 6.0

Testing:

Speed rpm : 200 Minimum rack trave: 8.00 rpm : 300

Rack travel in mm : 5.90...6.10

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 rpm Pressure hPa :

: 8.70...8.80 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : 300

Rack travel in m: 9.50...9.70

2nd pressure hPa : 650

Rack travel in m: 11.60...11.80 3rd pressure hPa : 1200

Rack travel in m: 12.40...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm: 750
Del.quantity cm3/: 143.5...146.5
1000 s: (141.0...149.0)

cm3 : 5.00Spread

1000 s: (7.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 64.0...66.0 1000 s: (62.0...68.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40

rpm : 1040...1055 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...150.0 1000 s: (137.0...153.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 5.90...6.10
Del.quantity cm3/: 11.0...15.0
1000 s: (8.5...17.5)
Spread cm3 : 3.50
1000 s: (5.50)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

: 3.75...3.85 BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : (3.70...3.90) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : IHC 7,6 V : 21.06.91 : 05.11.90 Test sheet Edition Replaces Test oil : ISO-4113 : 0-60-120-180-240-300 Phasina Combination no. : 0 403 446 230 Tolerance + - ° : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/320RS1185 : 0 413 406 170 EP type number 1st speed rpm: 1200 Governor Governor design. : RQV350...1200MW64-2 Rack travel in mm : 14.00...14.10 : 0 420 083 194 Governer no. Del.quantity cm3/: 14.2...14.4 Customer—spec. information 100 s: (14.0...14.6) Customer : NAVISTAR Engine : DTA-466 Spread cm3 : 0.3: 201.0 1st version kW 100 s: (0.6) : 2400 Rated speed rpm : 350.02nd speed TEST BENCH REQUIREMENTS Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 1.4...1.8 100 s: (1.1...2.0) Test oil inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 2 417 413 038 (B) Setting of injection pump with governor Inlet press., bar: 2.80 GUIDE SLEEVE TRAVEL rpm : 1350 Test nozzle holder 1st speed : 1 688 901 101 : 8.30...8.50 travel mm assembly rpm : 1460 2nd speed : 9.10...9.50 Opening travel mm rpm : 550 : 207...210 3rd speed pressure, bar : 3.10...3.70 travel mm : 350 : 1.30...1.70 Orifice plate 4th speed rpm diameter mm : 0,6 travel mm FULL LOAD DELIV. AT FULL LOAD STOP : 1 680 750 008 Test lines 1st version rpm : 1200 Outside diameter Speed x Wall thickness Aneroid pressure h: 800 : 142.5...144.5 x Length mm : 6.00X2.00X600 Del.quantity 1000 : (140.5...146.5) : 3.50 (A) Injection pump setting values Spread cm3 Insp. values in parentheses 1000 : (6.00) Set equal delivery quant. RATED SPEED per values BEGINNING OF DELIVERY 1st version Test pressure, bar: 30...32 Control lever

position degrees: 42...50

Testing: 1st rack travel in: 13.00 rpm : 1265...1285 Speed 2nd rack travel in: 4.00 Speed rpm : 1415...1425 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 9...17 Setting point w/out bumper spring rpm Rack travel in mm: 6.1 Testing: Speed rpm : 100 Minimum rack trave: 9.00 : 350 Speed rpm Rack travel in mm : 6.00...6.20 CONSTANT REGULATION rpm : 360...450 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1200 1st speed Rack travel in m: 14.00...14.10 : 800 2nd speed rpm Rack travel in m: 14.40...14.60 3rd speed rpm : 1150 Rack travel in m: 14.10...14.30 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 265 mm : 11.50...11.60 Speed rpm Pressure Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.10...10.20 2nd pressure hPa : 480 Rack travel in m: 13.30...13.60 3rd pressure hPa : 800 Rack travel in m: 14.40...14.60 START CUT-OUT 1/min: 280 (290) Speed FUEL DELIVERY CHARACTERISTICS

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.00 Speed rpm : 1265...1285

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 140.0...180.0 1000 s: (137.0...183.0) Rack travel in mm : 19.00...21.00

LOW IDLE

Remarks:

: IHC #1815225C91

Only perform pump setting with original overflow valve without IH hose and restrictor 1.2 mm diameter.

Before checking sleeve position, first adjust latching.

In unlatched condition, do not operate greater than n = 500 1/min

Set shutoff stop 1.5...2.0 mm before shutoff.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.00...4.10 Prestroke mm : (3.95...4.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Note remarks Firing order Test sheet : FIA 8,1 D Edition : 21.06.91 Replaces : ISO-4113 : 0-60-120-180-240-300 Test oil Phasing Tolerance + - ° Combination no. : 0 403 446 249 : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/720RS1197 : 0 413 406 185 rom: 1350 EP type number 1st speed Governor Governor design. : RQV325...1350MW109K Rack travel in mm : 14.00...14.10 : 0 420 083 997 Governer no. Del.quantity cm3/: 10.0...10.2 Customer-spec. information 100 s: (9.8...10.4) Customer : IVECO-FIAT : 8060.45.6700 cm3 : 0.3Engine Spread : 165.0 100 s: (0.6) 1st version kW : 2700 Rated speed 2nd speed rpm : 325.0 Rack travel in mm : 7.7...7.9 Del.quantity cm3/ : 2.5...2.9 TEST BENCH REQUIREMENTS 100 s: (2.2...3.1) Test oil inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 1 457 413 010 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 1400 : 10.00...10.40 : 1 688 901 101 travel mm assembly rpm : 825 2nd speed : 4.90...5.10 travel mm Opening 1 : 207...210 : 400 3rd speed pressure, bar rpm : 2.90...3.50 travel mm : 325 Orifice plate 4th speed rpm : 1.50...1.90 diameter mm : 0,6 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 014 1st version Outside diameter Speed rpm : 1350 x Wall thickness Aneroid pressure h: 850 : 6.00X2.00X600 : 100.0...102.0 x Length mm Del.quantity 1000 : (98.0...104.0) (A) Injection pump setting values cm3 : 3.50 Spread Insp. values in parentheses 1000 : (6.00) Set equal delivery quant. per values RATED SPEED BEGINNING OF DELIVERY 1st version

Control lever

position degrees: 117...125

Test pressure, bar: 30...32

Del.quantity cm3/: 102.5...105.5 1000 s: (100.0...108.0) Testing: 1st rack travel in: 13.00 cm3 : 5.00Spread rpm : 1410...1420 1000 s: (7.0) Speed Aneroid pressure h: 850 2nd rack travel in: 4.00 : 1495...1525 Speed rpm : 1000 Del.quantity cm3/ : 101.5...104.5 1000 s: (99.0...107.0) Speed rpm 4th rack travel in: 1600 rpm : 0.00...1.00Speed Aneroid pressure h: 850 Speed rpm : 600 Del.quantity cm3/ : 106.5...109.5 1000 s: (104.0...112.0) LOW IDLE 1 Control lever position degrees: 78...86 Setting point w/out bumper spring Aneroid pressure h: rpm : 500 Speed rpm Del.quantity cm3/: 77.5...79.5 Rack travel in mm: 7.8 1000 s: (75.5...81.5) Testing: Speed : 200 rpm Minimum rack trave: 10.00 **BREAKAWAY** Speed rpm : 325 Rack travel in mm : 7.70...7.90 1st version 1mm rack travel less than TORQUE CONTROL Torque control curve - 1st version full load rack tr: 13.00 rpm : 1350 rpm : 1410...1420 1st speed Speed Rack travel in m: 14.00...14.10 rpm : 1200 2nd speed STARTING FUEL DELIVERY Rack travel in m: 13.70...13.90 d speed rpm : 1000 Rack travel in m: 13.30...13.50 3rd speed Speed rpm : 100 Del.quantity cm3/ : 65.0...85.0 : 600 4th speed rpm Rack travel in m: 13.30...13.50 1000 s: (62.0...88.0) Aneroid/Altitude LOW IDLE Compensator Test Speed rpm : 325 Rack travel in mm : 7.70...7.90 Del.quantity cm3/: 25.0...29.0 1000 s: (22.5...31.5) Spread cm3: 3.50 1st version Setting : 500 Speed rpm Pressure 1000 s: (5.50) hPa : -: 11.30...11.40 Rack travel mm Remarks: Measurement  $1/\min : 500$ Speed 1st pressure hPa : 450 Rack travel in m: 11.70...11.80 2nd pressure hPa : 650 Rack travel in m: 12.80...13.10 3rd pressure hPa : 850 Rack travel in m: 13.30...13.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 850 : 1200 Speed rpm

Note remarks

Test sheet : MAN 7,2 W Edition : 21.06.91 Replaces : 20.07.90 Test oil : ISO-4113

Combination no. : 0 403 456 109

Injection pump

Pump designation : PES6MW100/321RS1200

EP type number : 0 413 406 189

Governor

Governor design. : RQV250...1200MW83-2

: 0 420 083 216 Governer no.

Customer-spec. information Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 008 Test Lines

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 : (3.45...3.65) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2) cm3 : 0.3 100 s: (0.5)

Spread

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

: 10.50...10.60 travel mm

rpm : 810 2nd speed

: 5.90...6.10 rpm : 500 travel mm 3rd speed

travel mm

: 3.70...4.30 rpm : 250 4th speed

: 1.20...1.60 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1000

Del.quantity : 137.0...139.0 1000 : (135.0...141.0)

cm3 : 3.50

1000 : (6.00)

RATED SPEED

Spread

1st version Control lever

position degrees: 120...128

Testing: 1st rack travel in: 11.50 rpm : 1245...1260 Speed 2nd rack travel in: 4.00 rpm : 1300...1330 Speed 4th rack travel in: 1400 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 77...85 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm: 5.0 Testing: Speed : 100 rpm Minimum rack trave: 6.50 rpm : 250 Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 330...420 Speed Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 170 Speed rom Pressure Rack travel mm : 10.00...10.10 Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 9.70...9.80 2nd pressure hPa : 550
Rack travel in m: 11.90...12.20
3rd pressure hPa : 1000
Rack travel in m: 12.50...12.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 : 600 Speed rpm Del.quantity cm3/: 135.0...138.0 1000 s: (132.5...140.5) Spread cm3 : 5.00 1000 s: (7.0) Aneroid pressure h: 1000 : 800 Speed rpm Del.quantity cm3/: 138.0...141.0 1000 s: (135.5...143.5) Aneroid pressure h: 1000 Speed rpm : 1200

Del.quantity cm3/: 136.0...139.0 1000 s: (133.5...141.5) Aneroid pressure h: -Speed rpm: 500 Del.quantity cm3/: 74.0...76.0 1000 s: (72.0...78.0) BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.50 Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 80.0...100.0 1000 s: (77.0...103.0)

LOW IDLE

Remarks:

: MAN 3-7036

Start-of-delivery mark is at start of delivery of cylinder 1

Note remarks

: MAN 7,2 V : 28.06.91 Test sheet Edition : 20.07.90 Replaces Test oil : ISO-4113

: 0 403 456 110 Combination no.

Injection pump

Pump designation : PES6MW100/321RS1201

: 0 413 406 190 EP type number

Governor

Governor design. : RQ250/1200MW84-3 : 0 420 082 043 Governer no.

Customer-spec. information Customer : MAN

: D 0826 LF02 Engine

: 169.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60 : (3.45...3.65)

Rack travel in mm : 15.00...0.00

Firina order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0 Rack travel in mm: 5.4...5.6

Del.quantity cm3/: 1.6...2.0 100 s: (1.3...2.2)

cm3 : 0.5Spread

100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

: 8.40...8.80 travel mm

: 1260 2nd speed rpm

6.60...6.80 travel mm

: 345 3rd speed rom

: 4.00...4.60 travel mm

: 250 4th speed rpm

travel mm : 1.80...2.20

GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

rpm : 600 Speed

Rack travel in mm : 18.20...19.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Spread

Speed rpm : 1000 Aneroid pressure h: 1000

Del.quantity : 137.0...139.0 1000 : (135.0...141.0)

: 3.50 cm3

1000 : (6.00)

Rack travel in m: 12.70...12.90 RATED SPEED 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 92...100 1st version Aneroid pressure h: 1000 Setting point: : 600 Speed Speed rpm rpm Del.quantity cm3/: 137.0...140.0 Rack travel in mm: 19.0 1000 s: (134.5...142.5) cm3 : 5.00 Testing: Spread 1000 s: (7.0) 1st rack travel in: 11.30 rpm : 1245...1260 Aneroid pressure h: 1000 Speed 2nd rack travel in: 4.00 : 800 Speed rpm Del.quantity cm3/: 140.0...143.0 1000 s: (137.5...145.5) Aneroid pressure h: 1000 Speed rpm: 1300...1330 4th rack travel in: 1400 rpm : 0.00...1.00Speed : 1200 Speed rpm Del.quantity cm3/: 134.5...137.5 1000 s: (132.0...140.0) LOW IDLE 1 Control lever position degrees: 69...77 Aneroid pressure h: -: 500 Setting point w/out bumper spring Speed rpm Del.quantity cm3/: 74.0...76.0 1000 s: (72.0...78.0) rpm : 250 Rack travel in mm : 5.5 Testing: : 100 Speed BREAKAWAY rpm Minimum rack trave: 7.00 1st version rpm Rack travel in mm : 5.40...5.60 1mm rack travel less than TORQUE CONTROL full load rack tr: 11.30 Torque control curve - 1st version rpm : 1245...1260 Speed st speed rpm : 1000
Rack travel in m: 12.50...12.60 1st speed STARTING FUEL DELIVERY : 600 2nd speed rpm Rack travel in m: 12.70...12.90 3rd speed : 800 rpm : 100 rpm Speed Del.quantity cm3/: 60.0...80.0 Rack travel in m: 12.70...12.90 rpm : 1200 1000 s: (57.0...83.0) 4th speed Rack travel in m: 12.20...12.40 LOW IDLE Aneroid/Altitude Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5) Compensator Test 1st version Setting Spread cm3 : 5.00 : 500 Speed 1000 s: (7.00) rom hPa : 170 Pressure : 10.20...10.30 Rack travel mm Remarks: : MAN #3-7047 Measurement Setting and blocking of pointer of 1/min: 500 Speed start-of-delivery sensor on cyl. 1 start of delivery 1st pressure hPa : -Rack travel in m: 10.00...10.10 2nd pressure hPa : 550 Rack travel in m: 11.90...12.20

3rd pressure hPa : 1000

Note remarks

Test sheet : MAN 7,2 V 1 Edition : 28.06.91 : 18.02.91 Replaces : ISO-4113 Test oil

Combination no. : 0 403 456 114

Injection pump

Pump designation : PES6MW100/321RS1201

EP type number : 0 413 406 190

Governor

Governor design. : RQV250...1200MW83-2 Governer no. : 0 420 083 216

Customer-spec. information : MAN Customer

Engine : D 0826 LF02

: 169.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 Prestroke mm

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 13.7...13.9

100 s: (13.5...14.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.02nd speed Rack travel in mm : 5.4...5.6 Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 1250 : 10.50...10.60 travel mm

rpm : 810 2nd speed

: 5.90...6.10 travel mm

rpm : 500 3rd speed

: 3.70...4.30 travel mm

: 250 4th speed rpm

: 1.20...1.60 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1000

: 137.0...139.0 Del.quantity

1000 : (135.0...141.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 120...128

Testina: 1st rack travel in: 11.30 Speed rpm : 1245...1260 2nd rack travel in: 4.00 Speed rpm : 1320...1350 4th rack travel in: 1400 rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 70...78 Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 5.5 Testing: : 100 Speed rom Minimum rack trave: 7.00 Speed rpm: 250 Rack travel in mm: 5.40...5.60 CONSTANT REGULATION rpm : 330...420 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 12.50...12.60 rpm : 600 2nd speed Rack travel in m: 12.70...12.90 rpm : 800 3rd speed Rack travel in m: 12.70...12.90 th speed rpm : 1200 4th speed Rack travel in m: 12.20...12.40 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm hPa : 170 Pressure Rack travel mm : 10.20...10.30 Measurement 1/min: 500 Speed Rack travel in m: 10.00...10.10 2nd pressure hPa : 550 Rack travel in m: 11.90...12.20 3rd pressure hPa : 1000 Rack travel in m: 12.70...12.90 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 600

Del.quantity cm3/: 137.0...140.0 1000 s: (134.5...142.5) Spread cm3 : 5.00 1000 s: (7.0) Aneroid pressure h: 1000 : 800 Speed rpm Del.quantity cm3/: 140.0...143.0 1000 s: (137.5...145.5) Aneroid pressure h: 1000 : 1200 Speed rpm Del.quantity cm3/: 134.5...137.5 1000 s: (132.0...140.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 74.0...76.0 1000 s: (72.0...78.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.30 rpm : 1245...1260 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 60.0...80.0 1000 s: (57.0...83.0) LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

: MAN #3-7135 Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

: MAN 7,3 D 2 Test sheet : 21.06.91 Edition

Replaces

Test oil : ISO-4113

: 0 403 456 117 Combination no.

Injection pump

Pump designation : PES6MW100/321RS1215

EP type number : 0 413 406 205

Governor

Governor design. : RQV250...1200MW83-2

: 0 420 083 216 Governer no.

Customer-spec. information Customer : MAN

: D 0826 LF 04 Engine

: 199.0 1st version kW Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.50...3.60 : (3.45...3.65) Prestroke mm

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.60...13.70

Del.guantity cm3/: 16.3...16.5

100 s: (16.1...16.7)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 250.0 2nd speed Rack travel in mm: 6.2...6.4 Del.quantity cm3/: 2.1...2.5

100 s: (1.8...2.7) cm3 : 0.3Spread

100 s: (0.5)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1000 Speed Aneroid pressure h: 1200

Del.quantity : 103.0...167.0)

: 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 94...102

Testing:

1st rack travel in: 12.60

rpm : 1250...1260 Speed

2nd rack travel in: 4.00

Speed rpm : 1320...1350

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 32...40

Setting point w/out bumper spring

Speed rpm

Rack travel in mm: 6.3 Testing: Speed rpm : 150 Minimum rack trave: 8.00 rpm Rack travel in mm : 6.20...6.40 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed man hPa : 200 Pressure : 10.30...10.40 Rack travel mm Measurement Speed  $1/\min : 500$ 1st pressure hPa : -Rack travel in m: 10.00...10.10 2nd pressure hPa : 750 Rack travel in m: 12.60...12.90
3rd pressure hPa : 1200
Rack travel in m: 13.60...13.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm Speed : 600 Del.quantity cm3/: 167.0...170.0 1000 s: (164.5...172.5) cm3 : 5.00 Spread 1000 s: (7.0) Aneroid pressure h: 1200 : 800 Speed rpm Del.quantity cm3/: 163.0...166.0 1000 s: (160.5...168.5) Aneroid pressure h: 1200 Speed rpm : 1200 Del.quantity cm3/: 160.0...163.0 1000 s: (157.5...165.5) Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 77.0...79.0
1000 s: (75.0...81.0) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.60 Speed rpm : 1250...1260 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 70.0...90.0 1000 s: (67.0...93.0)

LOW IDLE

rpm : 250 Speed Rack travel in mm : 6.20...6.40 Del.quantity cm3/: 21.0...25.0 1000 s: (18.5...27.5) cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

: MAN 3-7138

Start-of-delivery mark is at start of delivery of cylinder 1

Note remarks

Test sheet : MWM 6,2 F Edition : 21.06.91

Replaces

Test oil : ISO-4113

: 0 403 466 125 Combination no.

Injection pump

Pump designation : PES6MW100/320/3RS116

: 0 413 406 196 EP type number

Governor

Governor design. : RSV325...900MW1A340

: 0 420 085 144 Governer no.

Customer-spec. information Customer

: TD 226 B-6 Engine

Rated speed : 1800

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 4.00...4.10 : (3.95...4.15)
Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

BASIC SETTING

Tolerance + - °

Phasing

rpm: 900 1st speed

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 11.6...11.8

100 s: (11.4...12.0)

: 0-60-120-180-240-300

: 0.50 (0.75)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 325.0 2nd speed

Rack travel in mm: 6.5...6.7 Del.quantity cm3/: 0.8...1.2

100 s: (0.5...1.4)

cm3 : 0.3 Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm: 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 900 Speed

: 116.5...118.5 Del.quantity 1000 : (114.5...120.5)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

rpm

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.40 Speed rpm : 940...950

2nd rack travel in: 4.00

Speed rpm: 980...1010 4th rack travel in: 1100

rpm : 0.30...1.70Speed

LOW IDLE 1 Control lever

position degrees: 65...73 Setting point w/out bumper spring

rpm : 325 Speed Rack travel in mm: 6.6

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 rpm : 325

Rack travel in mm : 6.50...6.70

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 9.40 rpm : 940...950 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 1000 s: (97.0...123.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 325 Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 8.0...12.0

1000 s: (5.5...14.5)

Spread

cm3 : 3.50 1000 s: (5.50)

Remarks:

Note remarks

: CUM 8,3 T : 05.07.91 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 466 126

Injection pump

Pump designation : PES6MW100/12DRS1218

: 0 413 406 208 EP type number

Governor

: RSV400...1050MW7A319 Governor design.

-17

: 0 420 085 174 Governer no.

Customer—spec. information Customer : CUMMINS

: 6 CTA Engine

: 261.0 : 2100 1st version kW Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.15...3.25 Prestroke mm : (3.10...3.30)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 15.30...15.40

Del.guantity cm3/: 20.7...20.9

100 s: (20.5...21.1)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 400.0 2nd speed

Rack travel in mm: 7.2...7.4 Del.quantity cm3/: 1.7...2.1

100 s: (1.5...2.4)

cm3 : 0.3

Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1050 Speed

: 207.0...209.0 Del quantity 1000 : (205.0...211.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 108...116

Setting point:

Speed rpm : 800 Rack travel in mm: 0.6 Testing: 1st rack travel in: 14.30 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1125...1155 Speed 3rd rack travel in: 4.00 Speed rpm: 1135...1165 4th rack travel in: 1250 Speed rpm : 0.30...1.70LOW IDLE 1 Control lever position degrees: 74...82 Setting point w/out bumper spring rpm : 400 Speed Rack travel in mm: 6.8 Testina: speed rpm : 100 Minimum rack trave: 19.00 Speed Speed rpm : 400 Rack travel in mm : 6.70...6.90 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 14.30 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 125.0...145.0 1000 s: (122.0...148.0) Rack travel in mm: 19.00...21.00 LOW IDLE Speed : 400 rpm Rack travel in mm : 7.20...7.40 Del.quantity cm3/: 17.5...21.5 1000 s: (15.0...24.0) cm3 : 3.50 1000 s: (5.50) Spread

Remarks:

: CUM #3919723

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

: KHD 4,1 H 2 Test sheet : 21.06.91 Edition : 19.03.91 Replaces Test oil : ISO-4113

: 0 403 474 014 Combination no.

Injection pump

Pump designation : PES4MW100/720RS1187

: 0 413 404 108 EP type number

Governor

Governor design. : RS300/1250MW0A344 Governer no. : 0 420 084 002

Customer-spec. information Customer : KHD

: BF 4L 913C Engine

1st version kW : 92.0 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.95...4.05 Prestroke mm : (3.90...4.10)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 7.2...7.4

Del.quantity cm3/: 1.2...1.6 100 s: (0.9...1.8)

cm3 : 0.3 Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 4.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1000

Del.quantity : 118.0...120.0 1000 : (116.0...122.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Setting point:

: 800 Speed rpm Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.00

rpm : 1290...1300 Speed 2nd rack travel in: 4.00

rpm : 1385...1415 Speed

4th rack travel in: 1550

rpm : 0.30...1.70Speed

LOW IDLE 1

Setting point w/out bumper spring

: 300 rpm Rack travel in mm: 7.3 : 300 Speed rpm

Rack travel in mm : 7.20...7.40

TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve – 1st version

: 1250 1st speed rpm

Rack travel in m: 11.90...12.00

: 800 2nd speed rom

Rack travel in m: 12.40...12.50

rpm : 900 3rd speed

Rack travel in m: 12.10...12.30

rpm : 1000 4th speed

Rack travel in m: 12.00...12.20

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rom hPa : -Pressure

Rack travel mm : 10.00...10.10

Measurement

1/min: 500 Speed

1st pressure hPa : 320 Rack travel in m: 10.80...11.00

2nd pressure hPa : 470

Rack travel in m: 11.70...11.90

3rd pressure hPa : 1000

Rack travel in m: 12.40...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 800 Del.quantity cm3/ : 113.5...116.5 1000 s: (111.0...119.0)

cm3 : 3.50Spread

1000 s: (7.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 66.0...68.0 1000 s: (64.0...70.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.00

rpm : 1290...1300

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 120.0...130.0

1000 s: (117.0...133.0)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 7.20...7.40

Del.quantity cm3/: 12.0...16.0 1000 s: (9.5...18.5)

cm3 : 3.50 Spread

1000 s: (5.00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

Note remarks

Test sheet : PEN 6,1 R Edition : 24.04.91

Replaces

Test oil : ISO-4113

Combination no. : 0 403 476 102

Injection pump

Pump designation : PES6MW100/320RS1211

EP type number : 0 413 406 202

Governor

Governor design. : RSV650...750MW4A311-

: 0 420 085 166 Governer no.

Customer—spec. information Customer : PENTA

Engine : TTD 61 AG

: 115.0 1st version kW : 1500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening 1

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 2.90...3.00 Prestroke mm

: (2.85...3.05)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 12.4...12.6

100 s: (12.2...12.8)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 650.0Rack travel in mm : 5.0...5.5 Del.quantity cm3/: 1.7...2.1 100 s: (1.5...2.2)

Spread cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 6.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

: 124.0...126.0 Del.quantity 1000 : (122.0...128.0)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 84...92

Setting point:

rpm Rack travel in mm: 0.6

Testing:

1st rack travel in: 10.20

rpm : 748...753 Speed 2nd rack travel in: 4.00 rpm : 773...788 Speed 3rd rack travel in: 4.00 \*
Speed rpm : 795...810
4th rack travel in: 1000

rpm : 0.30...1.70 Speed

LOW IDLE 1 Control lever

position degrees: 78...86 Setting point w/out bumper spring

Speed rpm : 650 Rack travel in mm : 4.2

Testing:

: 100 Speed rpm Minimum rack trave: 19.00 rpm : 650

Rack travel in mm : 4.00...4.50

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.20 rpm : 748...753 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 140.0...160.0 1000 s: (137.0...163.0)

LOW IDLE

Speed rpm : 650
Rack travel in mm : 5.00...5.50
Del.quantity cm3/: 17.0...21.0 1000 s: (15.5...22.5)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : PEN 6,1 Q 1 Test sheet : 28.06.91 Edition Replaces Test oil : ISO-4113 : 0 403 476 108 Combination no. Injection pump Pump designation : PES6MW100/320RS1132 EP type number : 0 413 406 124 Governor Governor design. : RSV325...1400MW2A314 : 0 420 085 173 Governer no. Customer-spec. information : PENTA Customer : TD 610M Engine 1st version kW : 147.0 Rated speed : 2800 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 457 413 010 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness : 2.00x6.00x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) BASIC SETTING rpm : 10001st speed Rack travel in mm : 11.30...11.40 Del.guantity cm3/: 9.6...9.8 100 s: (9.4...10.0) cm3 : 0.3Spread 100 s: (0.6) rpm : 325.0 2nd speed Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 1.2...1.6 100 s: (0.9...1.8) cm3 : 0.3 100 s: (0.5) Spread GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Rack travel in mm : 0.30...1.00 Governor spring pre-tension Click setting x : 3.20FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000Aneroid pressure h: 900 : 96.0...98.0 Del.quantity 1000 : (94.0...100.0) : 3.50 cm3 Spread 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 104...112 Setting point: rpm : 800 Speed Rack travel in mm: 0.6 Testing:

Rack travel in mm : 9.00...12.00

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

: 2.90...3.00 : (2.85...3.05)

1st rack travel in: 10.30 Speed rpm : 1440...1450 2nd rack travel in: 4.00 Speed rpm: 1520...1540 3rd rack travel in: 4.00 rpm : 1540...1570 Speed 4th rack travel in: 1650 rpm : 0.30...1.70Speed LOW IDLE 1 Control Lever position degrees: 68...76 Setting point w/out bumper spring rpm Rack travel in mm : 5.6 Testing: Speed rpm Minimum rack trave: 19.00 Speed rpm : 325 Rack travel in mm : 5.50...5.70 Rack travel in mm : 2.00 rpm : 540...600 Speed Aneroid/Altitude Compensator Test 1st version Setting : 1000 Speed rpm Pressure hPa : : 10.10...10.20 Rack travel mm Measurement 1/min: 1000 Speed 1st pressure hPa : 130 Rack travel in m: 10.20...10.30 2nd pressure hPa : 420 Rack travel in m: 11.00...11.30 3rd pressure hPa : 900 Rack travel in m: 11.30...11.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 1000 Del.quantity cm3/ : 78.0...80.0 1000 s: (76.0...82.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

rpm : 1440...1450 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 125.0...145.0 1000 s: (122.0...148.0) Rack travel in mm : 19.00...21.00 LOW IDLE

Speed rpm: 325
Rack travel in mm: 6.00...6.20 Del.quantity cm3/: 12.0...16.0 1000 s: (9.5...18.5) cm3 : 3.50Spread 1000 s: (5.50)

Remarks: :

E26

full load rack tr: 10.30

### Note remarks

: KHD 13,4 F Test sheet : 21.06.91 Edition : 28.11.88 Replaces : ISO-4113 Test oil

: 0 403 548 027 Combination no.

Injection pump

Pump designation : PE8MW100/720LS1173

EP type number : 0 413 508 108

Governor

Governor design. : RQV300...1150MW99 Governor no. : 0 420 083 163

Customer-spec. information Customer : KHD

: F8L513 Engine

: 188.0 1st version kW : 2300 Rated speed

#### TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

· 1 417 413 D47

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

: 1 680 740 014 Test Lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.10...3.20 Prestroke mm

: (3.05...3.25) Rack travel in mm : 9.00...12.00

Firing order : 1-8-7-2-6-5-

: 0-45-90-135-180-225-Phasing

270-315

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 11.5...11.7

100 s: (11.3...11.9)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 300.0Rack travel in mm : 5.0...5.2 Del.quantity cm3/ : 1.1...1.5

100 s: (0.8...1.7)

cm3 : 0.3 Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1280 1st speed

: 11.10...11.50 travel mm

rpm : 1190 2nd speed

: 10.10...10.30 travel mm

3rd speed rpm : 400

: 2.90...3.50 travel mm

: 300 4th speed rpm

: 2.20...2.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1200

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

Del.quantity : 115.0...117.0 1000 : (113.0...119.0)

Spread cm3 : 3.50

1000 : (6.00)

RATED SPEED

1st version Control lever position degrees: 45...53 Testina: 1st rack travel in: 11.00 rpm : 1190...1200 2nd rack travel in: 4.00 Speed rpm : 1290...1320 4th rack travel in: 1370 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 13...21 Setting point w/out bumper spring rpm : 300° Rack travel in mm: 5.1 Testing: Speed rpm : 100 Minimum rack trave: 7.00 Speed rpm : 300 Rack travel in mm : 5.00...5.20 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 12.00...12.10 2nd speed rpm : 650 Rack travel in m: 12.30...12.40
3rd speed rpm : 1000
Rack travel in m: 12.20...12.30 START CUT-OUT 1/min: 220 (250) Speed FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 650 Del.quantity cm3/ : 113.5...116.5 1000 s: (111.0...119.0) cm3 : 5.00Spread 1000 s: (7.0) **BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.00 Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100 bel.quantity cm3/ : 135.0...155.0 1000 s: (132.0...158.0)

LOW IDLE

Speed rpm: 300
Rack travel in mm: 5.00...5.20
Del.quantity cm3/: 11.0...15.0
1000 s: (8.5...17.5)
Spread cm3: 3.50
1000 s: (5.50)

Remarks:

#### Note remarks

: KHD 13,4 F1 Test sheet : 21.06.91 Edition : 07.02.89 Replaces Test oil : ISO-4113

: 0 403 548 032 Combination no.

Injection pump

Pump designation : PE8MW100/720LS1173

EP type number : 0 413 508 108

Governor

Governor design. : RQ300/1150MW61-2 : 0 420 082 036 Governer no.

Customer-spec. information Customer : KHD

: F8L513 Engine

1st version kW : 188.0 : 2300 Rated speed

# TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.10...3.20

: (3.05...3.25) Rack travel in mm : 9.00...12.00

: 1-8-7-2-6-5-Firing order Phasina : 0-45-90-135-180-225-270-315

BASIC SETTING

Tolerance + - °

rpm: 1150 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 11.5...11.7

100 s: (11.3...11.9)

: 0.50 (0.75)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 1.1...1.5 100 s: (0.8...1.7)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1270 : 8.50...9.00 travel mm rpm : 1210 2nd speed : 6.60...6.80 travel mm 3rd speed : 420 rpm travel mm : 3.50...4.10

: 300 4th speed rpm : 1.50...1.90 travel mm

GUIDE SLEEVE POSITION Control-Lever position

Degree: 107 rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

: 115.0...117.0 Del.quantity 1000 : (113.0...119.0)

: 3.50 Spread cm3 : (6.00) 1000

RATED SPEED

F01

1st version Control lever position degrees: 26...34 Setting point: Speed rpm Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.00 rpm : 1190...1205 Speed 2nd rack travel in: 4.00 Speed rpm: 1245...1275 4th rack travel in: 1350 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 8...16 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.0 Testing: rpm : 100 Speed Minimum rack trave: 6.50 Speed rpm : 300 Rack travel in mm : 4.90...5.10 TORQUE CONTROL Torque control curve - 1st version rpm : 1150 1st speed Rack travel in m: 12.00...12.10 2nd speed rpm : 650 Rack travel in m: 12.30...12.40 3rd speed rpm : 1000 Rack travel in m: 12.20...12.30 START CUT-OUT Speed 1/min: 220 (250) FUEL DELIVERY CHARACTERISTICS 1st version : 650 Speed rpm Del.quantity cm3/: 113.5...116.5 1000 s: (111.0...119.0) cm3 : 5.00Spread 1000 s: (7.0)

# STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 135.0...155.0 1000 s: (132.0...158.0)

#### LOW IDLE

Remarks:

F02

Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.00

rpm : 1190...1205

Note remarks

Test sheet : KHD 13,4D18 Edition : 28.06.91

Replaces

Test oil : ISO-4113

Combination no. : 0 403 548 038

Injection pump

Pump designation : PE8MW100/720LS1128

EP type number : 0 413 508 103

Governor

Governor design. : RQ300/1200MW71-1 : 0 420 082 060 Governer no.

Customer-spec. information

Customer : KHD

: BF8L513 Engine

: 172.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 740 014

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 3.10...3.20 Prestroke mm

: (3.05...3.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 7- 2- 6- 5-4- 3

Phasina : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 11.90...12.00

Del.quantity cm3/: 10.7...10.9

100 s: (10.5...11.1)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.3...1.7

100 s: (1.0...1.9)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1150 : 6.40...6.60 travel mm

rpm : 1200 2nd speed

: 9.50...10.40 travel mm : 800 3rd speed rpm

5.80...6.20 travel mm

300 4th speed rpm

: 1.70...2.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 650

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

: 107.0...109.0 Del.quantity

1000 : (105.0...111.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

F03

1st version Control Lever position degrees: 27...35 Setting point: Speed rpm Rack travel in mm: 20.0 Testing: 1st rack travel in: 10.90 Speed rpm : 1240...1155 2nd rack travel in: 4.00 Speed rpm : 1325...1355 4th rack travel in: 1400 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 10...18
Setting point w/out bumper spring
Speed rpm : 300
Rack travel in mm : 6.5 Testing: Speed : 200 rpm Minimum rack trave: 8.00 Speed rpm : 300 Rack travel in mm : 6.40...6.60 START CUT-OUT 1/min : 220 (250) Speed **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.90 Speed rpm : 1240...1155 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 135.0...155.0 1000 s: (132.0...158.0) LOW IDLE : 300 Speed rpm Rack travel in mm : 6.40...6.60 Del.quantity cm3/: 13.0...17.0 1000 s: (10.5...19.5) Spread cm3: 3.50 1000 s: (5.50) Remarks:

Note remarks

Test sheet : MWM 5,9 h Edition : 24.06.91 : 21.5.87 Replaces : TSO-4113 Test oil

Combination no. : 9 400 085 270

Injection pump

Pump designation : PES6A90D320RS2718 : 9 400 084 003 EP type number

Governor

Governor design. : RSV350...1400A2B2215

-1R

: 9 420 083 231 Governer no.

Customer-spec. information Customer : MWM

Engine : D229/6

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 046

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening 1

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm

: 2.70...2.80 : (2.65...2.85)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-Firing order

: 0.50 (0.75) Tolerance + - °

: 0-60-120-180-240-300

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00 & maximum rack tra: 21.00 Difference ° CS : 3.00...4.00

BASIC SETTING

Phasing

rpm: 1400 1st speed

Rack travel in mm : 8.50...8.60

Del.quantity cm3/: 6.1...6.2

100 s: (5.9...6.4)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 350 2nd speed

Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 1.1...1.5

100 s: (0.9...1.7)

cm3 : 0.2Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed Rack travel in mm : 0.30...1.00

Governor spring pre-tension Click setting x : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1400 Speed

: 61.5...62.5 Del.quantity 1000 : (59.5...64.5)

: 3.00 Spread cm3 1000 : (5.00)

RATED SPEED

1st version Control lever

position degrees: 55...63

Testing:

1st rack travel in: 7.50 rpm : 1440...1450 Speed 2nd rack travel in: 4.00 Speed rpm : 1475...1505 4th rack travel in: 1650 Speed rpm : 0.30...1.70 LOW IDLE 1 Control lever position degrees: 21...29 Setting point w/out bumper spring rpm Rack travel in mm: 5.0 Testing: rpm : 100 Speed Minimum rack trave: 19.00 Speed rpm: 350
Rack travel in mm: 5.40...5.50
Rack travel in mm: 2.00 : 560...620 Speed rpm TORQUE CONTROL Torque control curve - 1st version rpm : 1400 1st speed Rack travel in m: 8.50...8.60 nd speed rpm : 500 Rack travel in m: 9.10...9.20 2nd speed 4th speed rpm : 900 Rack travel in m: 8.80...9.10 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 56.0...58.0 1000 s: (53.5...60.5) rpm : 900 Speed Del.quantity cm3/: 64.0...66.0 1000 s: (61.5...68.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 7.50 Speed rpm : 1440...1450 STARTING FUEL DELIVERY Speed rpm: 100 Rack travel in mm: 19.00...21.00 LOW IDLE

Speed

F06

rpm

: 350

Rack travel in mm : 5.40...5.60 Del.quantity cm3/ : 11.0...15.0 1000 s: (9.0...17.0) Spread cm3 : 2.50 1000 s: (4.50)

:

Remarks:

Note inst. in remarks column

Test scheet : FIA 5,5 R10 : 16.07.91 Edition

replaces

Calibrating oil : ISO-4113

: VE4/11F1900R393 Injection pump : 0 460 414 078 Type number

Customer Part-No.

Customer-specific information Customer : SOFIM

: 8140.47.2700 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

bar: 250.00...253.00 Pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 450 x Length

Start of delivery Prestroke mm: -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100 Charge press. hPa: 1000

Setting value mm: 1.40...1.80

electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100 Charge press hPa: 1000 Setting value bar: 5.20...5.80

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 1800 Charge press. hPa: 1000
Del. quantity cm3/
1000s.: 60.50...61.50

Shutoff

electromagnet Volt: 12 cm3/: 4.0 Dispersion 1000s.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 550

Del. quantity cm3/ 1000s.: 24.50...25.50

Shutoff

electromagnet Volt: 12

Low-idle speed regulation

1/min: 375

Del. quantity cm3/

1000s.: 11.00...15.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 6.9 1000s.: (6.5)

Full-load speed regulation

Speed 1/min: 2100 Charge press hPa: 1000

Del. quantity cm3/ 1000s.: 40.00...46.00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100

Del. quantity\_cm3/: 40.00...70.00

mind 1000s.: 40.00

Shutoff

electromagnet Volt: 12

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

1/min: 1100 Charge press hPa: 1000

F07

Inj.—qty. cm3/	+ 4th speed 1/min: 1500
difference 1000S.: -21.7023.70	+ Charge press. hPa: 1000
Shutoff	+ Supply-pump
electromagnet Volt: 12	pressure bar: 6.507.10
TD-travel dif.measurement	+ Shutoff
correttore anticipo iniezione (SV)	+ electromagnet Volt: 12
1.Speed 1/min: 1100	† • · · · · · · · · · · · · · · · · · ·
Charge press hPa: 1000	<pre>+ Overlow quantity at overflow valve:</pre>
TD-travel	+
difference mm: -0.700.90	+ 1st speed 1/min: 550
Shutoff	Charge press. hPa: -
electromagnet Volt: 12	+ Shutoff
CD mass dif mass manual	
SP press.—dif.measurement	+ electromagnet Volt: 12
pompa di mandata (FP)	+ Overflow : 41.7083.40
1.Speed 1/min: 1100	+ quantity cm3/10s: (26.7098.40)
Charge press hPa: 1000	+ 2nd speed 1/min: 1900
Supply pump	+ Charge press. hPa: 1000
pressure	+ Shutoff
difference bar: -0,100.30	electromagnet Volt: 12
	7 etectionagnet vott. 12
Shutoff	+ Overflow : 55.60139.00
electromagnet Volt: 12	† quantity cm3/10s: (40.60154.00)
*·····································	The state of the s
Inspection pump test specifications	+ Delivery-quant. and breakaway char.:
Test specifications in parentheses	+
	+
Timing-device characteristic:	
	+ Charge-air pressure-setting
3rd speed 1/min: 1100	+ point hPa: 500
Charge press hPa: 1000	+ LDA-stroke mm: 6,0
TD travel mm: 1.401.80	+ Shutoff
mm: (0.902.30)	+ electromagnet Volt: 12
Shutoff	+ Del. quantity cm3/: 49.0050.00
electromagnet Volt: 12	1000s.: (45.5053.50)
5th speed 1/min: 1900	+ 2nd speed 1/min: 2300
Change pages block 1000	Change phase hPa: 1000
Charge press. hPa: 1000	+ Charge press. hPa: 1000
TD travel mm: 5.406.20	+ Shutoff
mm: (5.406.20)	+ electromagnet Volt: 12
Shutoff	+ Del. quantity cm3/: 0.005.00
electromagnet Volt: 12	+ 1000s.: (0.005.00)
6th speed 1/min: 1500	+ 3rd speed 1/min: 2200
Charge press. hPa: 1000	+ Charge press. hPa: 1000
	+ Shutoff
mm: (2.904.30)	+ electromagnet Volt: 12
Shutoff	+ Del. quantity cm3/: 19.0027.00
electromagnet Volt: 12	+ 1000s.: (17.0029.00)
-	+ 5th speed 1/min: 2100
Supply-pump pressure characteristic:	
cappey paris process containance receive	+ Charge press, hPa: 1000
	+ Charge press. hPa: 1000
2nd speed 1/min: 1100	+ Charge press. hPa: 1000 + Shutoff
2nd speed 1/min: 1100	+ Charge press. hPa: 1000 + Shutoff + electromagnet Volt: 12
Charge press. hPa: 1000	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00
Charge press. hPa: 1000 Supply—pump	- Charge press. hPa: 1000 - Shutoff - electromagnet Volt: 12 - Del. quantity cm3/: 40.0046.00 - 1000s.: (38.5047.50)
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000s.: (38.5047.50) 9th speed 1/min: 1900
Charge press. hPa: 1000 Supply—pump	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000s.: (38.5047.50) 9th speed 1/min: 1900
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80 Shutoff	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000s.: (38.5047.50) 9th speed 1/min: 1900 Charge press. hPa: 1000
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80 Shutoff electromagnet Volt: 12	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000S.: (38.5047.50) 9th speed 1/min: 1900 Charge press. hPa: 1000 Shutoff
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1900	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000S:: (38.5047.50) 9th speed 1/min: 1900 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1900 Charge press. hPa: 1000	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000s.: (38.5047.50) 9th speed 1/min: 1900 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 58.0063.00
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1900 Charge press. hPa: 1000 Supply-pump	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000s.: (38.5047.50) 9th speed 1/min: 1900 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 58.0063.00 1000s.: (57.0064.00)
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1900 Charge press. hPa: 1000 Supply-pump pressure bar: 7.608.20	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000s.: (38.5047.50) 9th speed 1/min: 1900 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 58.0063.00 1000s.: (57.0064.00)
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1900 Charge press. hPa: 1000 Supply-pump	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000s.: (38.5047.50) 9th speed 1/min: 1900 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 58.0063.00 1000s.: (57.0064.00)
Charge press. hPa: 1000 Supply-pump pressure bar: 5.205.80 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1900 Charge press. hPa: 1000 Supply-pump pressure bar: 7.608.20	Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.0046.00 1000s.: (38.5047.50) 9th speed 1/min: 1900 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 58.0063.00 1000s.: (57.0064.00) 12th speed 1/min: 1800

Shutoff	+ Injqty. cm3/: 21.7023.70
electromagnet Volt: 12	+ difference 1000s.: -
Del. quyntity cm3/: 60.5061.50	+ Shutoff
1000s.: (57.5064.50)	+ electromagnet Volt: 12
15th speed	∔ 4th speed 1/min: 1100
Charge press. hPa: 1000	+ Charge press. hPa: 1000
Shutoff	+ Injqty. cm3/: 25.5033.50
electromagnet Volt: 12	+ difference 1000S.:-
Del. quantity cm3/: 56.0061.00	+ Shutoff
10008.: (54.5062.50)	electromagnet Volt: 12
17th speed 1/min: 1100	+ 5th speed 1/min: 1100
Charge press. hPa: 1000	+ Charge press. hPa: 1000
Shutoff	Injqty. cm3/: 2.008.00
electromagnet volt: 12	+ difference 1000s.: -
Del. quantity cm3/: 55.0060.00	+ Shutoff
1000H.: (53.5061.50)	+ electromagnet Volt: 12
18th speed 1/min: 550	+ 2nd speed 1/min: 1100
Charge press. hPa: -	+ Charge press hPa: 1000
Shutoff	+ TD-travel : 0.700.90
electromagnet Volt: 12	+ difference mm: -
Del. quantity cm3/: 24.5025.50	+ Shutoff
1000s.: (21.5028.50)	electromagnet Volt: 12
20th speed 1/min: 550	4th speed 1/min: 1100
Charge press. hPa: 1000	Charge press. hPa: 1000
Shutoff	+ TD-travel : 0.401.20
electromagnet Volt: 12	+ difference mm: -
Del. quantity cm3/: 58.5067.50	+ 2nd speed 1/min: 1100
1000s.: (57.5068.50)	+ Charge press. hPa: 1000
	+ Supply pump-
Mech. shutoff:	+ pressure : 0.100.30
	+ difference bar: -
Electr. shutoff:	↓ Shutoff
	+ electromagnet Volt: 12
1st speed 1/min: 375	
Del. quantity cm3/: 0.003.00	+ Automatic starting fuel delivery:
1000s.: (0.003.00)	Automater bear tring race activory.
Shutoff	1st speed 1/min: 300
	+ Shutoff
electromagnet volt: -	
Tall - al-1-2 ()	+ electromagnet Volt: 12
Idle delivery:	Del. quantity cm3/: 40.0080.00
4	† 1000s.: (40.0080.00)
1st speed 1/min: 375	†
Shutoff	+ 2nd speed 1/min: 400
electromagnet Volt: 12	+ Shutoff
Del. quantity cm3/: 11.0015.00	+ electromagnet Volt: 12
1000s.: (9.0017.00)	+ Del. quantity cm3/: 10.0040.00
1000s.: (9.0017.00) Dispersion cm3/: 6.0	Del. quantity cm3/: 10.0040.00 1000s.: (10.0040.00)
1000s.: (6.5)	+
2nd speed 1/min: 450	+ 4th speed 1/min: 100
Shutoff	+ Shutoff
electromagnet Volt: 12	+ electromagnet Volt: 12
Del. quantity cm3/: 0.005.00	Del. quantity cm3/: 40.0070.00
1000s.: (0.005.00)	10008:: (40.0070.00)
10000 (0.00).00/	10000(40.00/0.00)
Load-dependent start of dolayony	Shutoff electromagnet:
Load-dependent start of delivery:	+ Shutoff electromagnet:
Injqty.dif.measurement:	T Cut-in
2nd anal 1/min. 1100	+ Cut-in
2nd speed 1/min: 1100	min voltage : 10.0
Charge press. hPa: 1000	+ Rated voltage : 12.0
	†

Mounting and assembly dimensions:

Designation

mm: 3,2...3,4 mm: K-OT mm: 0,8...1,2 K KF MS mm: 0,8...1,2 mm: 3,0 mm: 6,0 mm: 20,0...22,0 mm: 13,1...16,5 SVS max. LDA stroke

ΧK XL

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

Test scheet : MAN 5,6 P10 : 16.07.91 Edition

replaces

Calibrating oil : ISO-4113

: VE6/11F1350R55-12 Injection pump : 0 460 416 066 Type number

Customer Part-No. :

Customer-specific information

Customer

: D 0226 MF/125 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 000 assembly

Openina

bar: 147.00...150.00 Pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

mm: 0,55 Prestroke

(from BDC): +0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel

1/min: 1000 Speed

Setting value mm: 5.80...6.20

Shutoff

electromagnet Volt: 24

Supply-pump pressure

Speed

1/min: 1000

Setting value bar: 5.10...5.70

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

1/min: 1000 Speed

Del. quantity cm3/ 1000s.: 63.50...64.50

Shutoff

electromagnet Volt: 24 Dispersion cm3/: 3.5 1000s.: (4.0)

Low-idle speed regulation

1/min: 300 Speed

Del. quantity cm3/

1000s.: 7.00...13.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 3.0

1000s.: (3.5)

Full-load speed regulation

1/min: 1400 Speed

Del. quantity cm3/ 1000s.: 45.00...51.00

Shutoff

electromagnet Volt: 24

Start:

1/min: 100

Del. quantity cm3/: 50.00...70.00

mind 1000s.: 50.00

Shutoff

electromagnet Volt: 24

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1350

mm: 8.00...8.80 TD travel

mm: (7.70...9.10)

Shutoff

electromagnet Volt: 24 3rd speed 1/min: 1000

mm: 5.80...6.20 TD travel

mm: (5.30...6.70)

Shutoff

electromagnet Volt: 24

4th speed 1/min: 600

mm: 2.80...3.60 mm: (2.50...3.90) TD travel

Shutoff

electromagnet Volt: 24

Supply-pump pressur	a characteristic:	+ 11th speed 1/min: 700 - Shutoff
authoral-brillo buesson	e characteristic:	electromagnet Volt: 24
1st speed 1/min: Supply-pump	600	Del. quantity cm3/: 49.5053.50 1000s.: (48.0055.00)
pressure bar: Shutoff	3.704.30	12th speed 1/min: 1000 Shutoff
electromagnet Volt:	24	electromagnet Volt: 24
2nd speed 1/min:		Del. quyntity cm3/: 63.5064.50
Supply-pump	-	1000s.: (61.5066.50)
pressure bar: Shutoff	5.105.70	- 20th speed 1/min: 600 - Shutoff
electromagnet Volt:	24	electromagnet Volt: 24
3rd speed 1/min:	1350	Del. quantity cm3/: 40.0044.00
Supply-pump	4	1000s.: (38.5045.50)
pressure bar:	6.206.80	-
Shutoff	-	Mech. shutoff:
electromagnet Volt:	24	- Mech. Abstellung:
otott, omag, lot tott		
Overlow quantity at	overflow valve:	1st speed
	-	Del. quantity cm3/: 0.003.00
1st speed 1/min:	600	1000s.: (0.003.00)
Shutoff	-	- Shutoff
electromagnet Volt:	24	- electromagnet volt: 24
Overflow:	41.7083.40	-
quantity cm3/10s:	(26.7098.40)	- Electr. shutoff:
2nd speed 1/min:	1350	-
Shutoff	4	- 1st speed 1/min: 300
electromagnet Volt:	24	- Del. quantity cm3/: 0.003.00
Overflow :	55.60139.00	- 1000s.: (0.003.00)
quantity cm3/10s:	(40.60154.00)	- Shutoff
quarterly one, too.	1,0.00	- electromagnet volt: -
Delivery-quant. and	breakaway char ·	- Ceceronagnee voce.
beenvery quarter and	Li cakaway char:	- Idle delivery:
	1	L
2nd speed 1/min:	1475	- 1st speed 1/min: 300
Shutoff	1	- Shutoff
electromagnet Volt:	24	- electromagnet Volt: 24
Del. quantity cm3/:	n 15 nn 1	- Del. quantity cm3/: 7.0013.00
1000s ·	(0.0015.00)	- 1000s.: (5.0015.00)
3rd speed 1/min:		- Dispersion cm3/: 3.0
Shutoff	7	- Vispersion dilb/. 3.0 - 1000s.: (3.5)
	3/. T	- 2nd speed 1/min: 450
electromagnet Volt: Del. quantity cm3/:	1 n z n	- Shutoff
1000c .	(0.003.00)	
5th speed 1/min:	1600	- electromagnet Volt: 24
	1400 T	- Del. quantity cm3/: 0.003.00 - 1000s.: (0.003.00)
Shutoff	7	- 10005.: (0.005.00)
electromagnet Volt:		- Automotic stanting for dalivenie
Del. quantity cm3/:	47.0071.00	<ul> <li>Automatic starting fuel delivery:</li> </ul>
10005.:	(43.5052.50)	- 1-+ 1/min. 700
8th speed 1/min:	1425	- 1st speed 1/min: 300
Shutoff	1	- Shutoff
electromagnet Volt:	15 00 /5 00	electromagnet Volt: 24
Del. quantity cm3/:	12.0042.00 †	- Del. quantity cm3/: 47.0063.00
	(15.0045.00)	- 1000s.: (47.0063.00)
9th speed 1/min:	1550 +	20-1
Shutoff	<u>_</u> , †	- 2nd speed 1/min: 400
electromagnet Volt:	<u> </u>	- Shutoff
Del. quantity cm3/:	68.50/1.50	- electromagnet Volt; 24
1000s.:	(67.0073.00)	-

Del. quantity cm3/: 38.00...50.00 1000s.: (38.00...50.00)

4th speed Shutoff 1/min: 100

electromagnet Volt: 24 Del. quantity cm3/: 50.00...70.00 1000s.: (50.00...70.00)

## Shutoff electromagnet:

Cut-in

min voltage Rated voltage : 20.0 : 24.0

# Mounting and assembly dimensions:

Designation

K mm: -

KF MS

SVS max.

mm: 5,6...6,0 mm: 1,1...1,5 mm: 2,3 mm: 17.0...19.0 mm: 10.9...14.3 XK XL

Remarks:

: MAN NR. 7941

Timing-device travel BOSCH-INJ.-PUMP TEST SPECIFICATIONS Speed 1/min: 1100 Charge press. hPa: 1000 Setting value mm: 1.80...2.20 Note inst. in remarks column Test scheet : CUM 3,9 D7 AFB/AFB : 16.07.91 Edition Volt: 12 : 11.86 valve replaces Shutoff Calibrating oil : ISO-4113 electromagnet Volt: 12 : VE4/12F1250R230 Injection pump Type number : 0 460 424 026 Supply-pump pressure Customer Part-No. 1/min: 1100 Speed Charge press hPa: 1000 Setting value bar: 4.70...5.30 Customer-specific information KSB/AFB Customer Volt: 12 valve : 4 BT- 390 AUTOM. Shutoff Engine electromagnet Volt: 12 KW: 77 Power 1/min: 2800 Full-load del. with charge press.: Speed 1/min: 900 TEST BENCH REQUIREMENTS Speed Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 69.50...70.50 Calibrating-oil return temp. KSB/AFB with thermometer : 40.00...48.00 Volt: 12 valve Shutoff Electronically : 42.00...50.00 electromagnet Volt: 12 cm3/: 4.0 Inlet press., bar: 0.30...0.40 Dispersion 1000s.: (4.5) Calibrating nozzle-holder : 1 688 901 027 Full-load del. w/out charge press.: assembly 1/min: 500 Opening Speed bar: 250.00...253.00 Del. quantity cm3/ Pressure 1000s.: 36.50...37.50 KSB/AFB Perforated plate Volt: 12 diameter mm: 0.5 valve Shutoff electromagnet Volt: 12 Test inj. tubing : 1 680 750 017 Low-idle speed regulation Outside diameter : 6.00 x Wall thickness : 2.00 1/min: 375 Speed mm: 840 Del. quantity cm3/ x Length 1000s.: 8.00...14.00 KSB/AFB Start of delivery valve Volt: 12 mm: 0.3Prestroke (from BDC): +-0.02(0.04)Shutoff electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000S.: (7.0) Start of delivery block mm: 1,66 mm: +0,02(0,06) Piston stroke Full-load speed regulation Outlet

Speed

1/min: 1500

Charge press hPa: 1000

11

Injection-pump setting values

Test specifications in parentheses

Del. quantity cm3/ Supply-pump bar: 4.70...5.30 1000s.: 54.00...60.00 pressure KSB/AFB KSB/AFB Volt: 12 Volt: 12 valve valve Shutoff Shutoff electromagnet Volt: 12 4th speed 1/min: 1400 Charge press. hPa: 1000 electromagnet Volt: 12 Start: Supply-pump Speed 1/min: 100 Del. quantity cm3/: 40.00...120.00 mind 1000s.: 40.00 bar: 5.90...6.50 pressure bar: (5.70...6.70) KSB/AFB Volt: 12 KSB/AFB valve Volt: 12 Shutoff Valve Shutoff electromagnet Volt: 12 electromagnet Volt: 12 Overlow quantity at overflow valve: Inspection-pump test specifications Test specifications in parentheses 1st speed 1/min: 500 Charge press. hPa: -KSB/AFB Timing-device characteristic: Volt: 12 valve 2nd speed 1/min: 1400 Shutoff hPa: 1000 Charge press electromagnet Volt: 12 mm: 2.90...3.70 mm: (2.60...4.00) : 41.70...83.40 TD travel Overflow | quantity cm3/10s: (26.70...98.40)
2nd speed 1/min: 1400
Charge press. hPa: 1000 KSB/AFB Volt: 12 valve KSB/AFB Shutoff electromagnet Volt: 12 valve Volt: 12 1/min: 1100 3rd speed Shutoff Charge press hPa: 1000 electromagnet Volt: 12 : 55.60...139.00 mm: 1.80...2.20 TD travel Overflow mm: (1.30...2.70) cm3/10s: (40.60...154.00) quantity KSB/AFB Delivery-quant. and breakaway char.: Volt: 12 valve Shutoff electromagnet Volt: 12 4th speed 1/min: 900 1/min: 700\* 1nd speed hPa: 1000 Charge-air pressure-setting Charge press mm: 0.40...1.00 hPa: 400 TD travel point mm: (0.00...1.40) LDA-stroke mm: 6.0 KSB/AFB KSB/AFB Volt: 12 valve Volt: 12 valve Shutoff Shutoff electromagnet Volt: 12 electromagnet Volt: 12 Del. quantity cm3/: 67.00...68.00 1000s.: (63.50...71.50) 2nd speed 1/min: 1650 Charge press. hPa: 1000 Supply-pump pressure characteristic: 1/min: 500 1st speed Charge press. hPa: 1000 KSB/AFB Supply-pump valve Volt: 12 Shutoff pressure bar: 2.10...2.70 electromagnet Volt: 12 Del. quantity cm3/: 0.00...3.00 KSB/AFB valve Volt: 12 1000S.: (0.00...3.00) 5th speed 1/min: 1500 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1100 Charge press. hPa: 1000 KSB/AFB

valve

Volt: 12

Shutoff electromagnet Volt: 12 Del. quantity cm3/: 54.0060.00 1000S.: (51.0063.00) 6th speed 1/min: 1590 Charge press. hPa: 1000 KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 15.0055.00 1000S.: (15.0055.00) 9th speed 1/min: 1400	electromagnet Volt: 12  Del. quantity cm3/: 8.0014.00  1000s.: (6.0016.00)  Dispersion cm3/: 5.5  1000s.: (7.0)  2nd speed 1/min: 600  KSB/AFB
Charge press. hPa: 1000 KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 64.5067.50	electromagnet Volt: 12 Del. quantity cm3/: 0.004.00 1000S.: (0.004.00) Automatic starting fuel delivery:
Del. quantity cm3/: 64.5067.50 1000S.: (63.0069.00) 12th speed 1/min: 900 Charge press. hPa: 1000 KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Del. quyntity cm3/: 69.5070.50 1000S.: (67.0073.00) 18th speed 1/min: 500 Charge press. hPa: - KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 36.5037.50 1000S.: (33.0041.00)  Mech. shutoff: Mech. Abstellung:  1st speed 1/min: 1400 Del. quantity cm3/: 0.003.00 1000S.: (0.003.00) Shutoff electromagnet volt: 12 KSB/AFB	1st speed 1/min: 150 KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.00120.00 1000s.: (40.00120.00)  2nd speed 1/min: 380 KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.0040.00 1000s.: (0.0040.00)  4th speed 1/min: 100 KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.00120.00 1000s.: (40.00120.00)  Shutoff electromagnet: Cut-in
Valve Volt: 12  Electr. shutoff:  1st speed 1/min: 375 Del. quantity cm3/: 0.003.00 1000S.: (0.003.00)  Shutoff electromagnet volt: -  Idle delivery:	min voltage : 10.0 Rated voltage : 12.0  Mounting and assembly dimensions:  Designation  K mm: -  KF mm: 5,05,4  MS mm: 0,91,2  SVS max. mm: 2,7  LDA stroke mm: 6.0  XK mm: 18.820.8  XL mm: 9.813.2

Remarks:

: C.D.C. # 390 8182

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : CUM 3,9 D : 16.07.91 Test scheet Edition : 11.86 replaces : ISO-4113 Calibrating oil : VE4/12F1250R230-1 Injection pump Type number : 0 460 424 027 Customer Part-No. : Customer-specific information Customer : 4 BT- 390 AUTOM. Engine KW: 77 Power Speed 1/min: 2500 TEST BENCH REQUIREMENTS Calibrating-oil return temp. with thermometer : 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar: 0.30...0.40 Calibrating nozzle-holder : 1 688 901 027 assembly Opening bar: 250.00...253.00 Pressure Perforated-plate diameter mm: 0.5 Test inj. tubing : 1 680 750 017 Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length Start of delivery mm: 0.3 Prestroke (from BDC): +-0.02(0.04)Start of delivery block mm: 1,66 Piston stroke mm: +0,02(0,06)

Timing-device travel Speed 1/min: 1100 Charge press. hPa: 1000 Setting value mm: 1.80...2.20 AFB/AFB Volt: 12 valve Shutoff electromagnet Volt: 12 Supply-pump pressure Speed 1/min: 1100 Charge press hPa: 1000 Setting value bar: 4,70...5.30 KSB/AFB Volt: 12 valve Shutoff electromagnet Volt: 12 Full-load del. with charge press.: Speed 1/min: 900 Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 69.50...70.50 KSB/AFB Volt: 12 valve Shutoff electromagnet Volt: 12 cm3/: 4.0 Dispersion 1000s.: (4.5) Full-load del. w/out charge press.: 1/min: 500 Speed Del. quantity cm3/ 1000s.: 36.50...37.50 11 KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Low-idle speed regulation 1/min: 340 Speed Del. quantity cm3/ 1000s.: 8.00...14.00 KSB/AFB Volt: 12 valve Shutoff electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0) Full-load speed regulation 1/min: 1330 Speed Charge press hPa: 1000

Outlet.

Injection—pump setting values

Test specifications in parentheses

Del. quantity cm3/ Shutoff 1000s.: 54.00...60.00 electromagnet Volt: 12 1/min: 1100 KSB/AFB 3rd speed Charge press. hPa: 1000 Volt: 12 valve Shutoff Supply-pump bar: 4.70...5.30 electromagnet Volt: 12 pressure KSB/AFB Volt: 12 Start: valve Shutoff 1/min: 100 electromagnet Volt: 12 Speed Del. quantity cm3/: 40.00...120.00 1/min: 1250 4th speed Charge press. hPa: 1000 1000s.: 40.00 mind Supply-pump KSB/AFB Volt: 12 bar: 5.40...6.00 Valve pressure Shutoff KSB/AFB Volt: 12 electromagnet Volt: 12 valve Shutoff electromagnet Volt: 12 Inspection—pump test specifications Test specifications in parentheses Overlow quantity at overflow valve: Timing-device characteristic: 1/min: 500 1st speed 1/min: 1200 2nd speed Charge press. hPa: hPa: 1000 Charge press KSB/AFB TD travel mm: 2.90...3.70 valve Volt: 12 mm: (2.60...4.00) Shutoff KSB/AFB electromagnet Volt: 12 : 41.70...83.40 Volt: 12 valve 0verflow cm3/10s: (26.70...98.40) quantity Shutoff 1/min: 1250 electromagnet Volt: 12 2nd speed 1/min: 1100 Charge press. hPa: 1000 3rd speed KSB/ĀFB Charge press hPa: 1000 Volt: 12 TD travel mm: 1.80...2.20 valve mm: (1.30...2.70) Shutoff electromagnet Volt: 12 KSB/AFB : 55.60...139.00 cm3/10s: (40.60...154.00) Volt: 12 Overflow valve Shutoff quantity electromagnet Volt: 12 4th speed 1/min: 900 Delivery-quant. and breakaway char.: hPa: 1000 Charge press mm: 0.30...1.10 TD travel mm: (0.00...1.40) 1/min: 700\* 1nd speed Charge-air pressure-setting KSB/AFB Volt: 12 hPa: 400 valve point Shutoff LDA-stroke mm: 6.0 KSB/AFB electromagnet Volt: 12 mm: 0.00...6.40 Volt: 12 TD travel valve mm: (0.00...1.00) Shutoff electromagnet Volt: 12 Del. quantity cm3/: 67.00...68.00 Supply-pump pressure characteristic: 1000s.: (63.50...71.50) 1/min: 1500 1/min: 500 1st speed 2nd speed Charge press. hPa: 1000 Charge press. hPa: 1000 Supply-pump KSB/ĀFB bar: 2.10...2.70 Volt: 12 pressure valve KSB/AFB Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Volt: 12 valve Shutoff electromagnet Volt: 12 1/min: 1330 5th speed

Charge press. hPa:	1000	+	1st speed 1/min: 340
KSB/AFB valve Volt:	12	1	KSB/AFB valve Volt: 12
Shutoff		+	Shutoff
electromagnet Volt: Del. quantity cm3/:	12 5/, 00 - 60, 00	İ	electromagnet Volt: 12 Del. quantity cm3/: 8.0014.00
1000s.:	(51.0063.00)	Į	1000S.: (6.0016.00)
6th speed 1/min:		+	Dispersion cm3/: 5.5
Charge press. hPa: KSB/AFB	1000	1	1000s.: (7.0) 2nd speed
valve Volt:	12	+	KSB/AFB
Shutoff electromagnet Volt:	12	1	valve Volt: 12 Shutoff
Del. quantity cm3/: 1000s.:	15.0055.00	Ŧ	electromagnet Volt: 12
	(15.0055.00)	+	Del. quantity cm3/: 0.004.00
9th speed 1/min: Charge press. hPa:		Ī	1000s.: (0.004.00)
KSB/ĀFB		+	Automatic starting fuel delivery:
valve Volt: Shutoff	12	İ	1st speed 1/min: 150
electromagnet Volt:	12	Ŧ	KSB/AFB
Del. quantity cm3/:	64.5067.50	+	valve Volt: 12
12th speed 1/min:	(63.0069.00) 900	Ī	Timing valve Volt: 12 Shutoff
Charge press. hPa:	1000	+	electromagnet Volt: 12
KSB/ĀFB valve Volt:	12	İ	Del. quantity cm3/: 40.00120.00 1000s.: (40.00120.00)
Shutoff	12	Ţ	
electromagnet Volt:	12	+	2nd speed 1/min: 380
Del. quyntity cm3/:	69.5070.50 (67.0073.00)	1	KSB/AFB valve Volt: 12
18th speed 1/min:		+	Shutoff
KSB/AFB valve Volt:	12	1	electromagnet Volt: 12 Del. quantity cm3/: 0.0040.00
Shutoff	12	Ţ	10005.: (0.0040.00)
electromagnet Volt:	12	+	/th annual 1/min 100
Del. quantity cm3/:	(33.0041.00)	Ţ	4th speed 1/min: 100 KSB/AFB
	(0010011111100)	+	valve Volt: 12
Mech. shutoff: Mech. Abstellung:		1	Shutoff electromagnet Volt: 12
meen. Abscettung.		Ţ	Del. quantity cm3/: 40.00120.00
1st speed 1/min:	1250	+	1000s.: (40.00120.00)
Del. quantity cm3/: 1000s:	(0.003.00)	‡	Shutoff electromagnet:
Shutoff		+	-
electromagnet volt: KSB/AFB	12	1	Cut-in min voltage : 10.0
valve Volt:	12	1	Rated voltage : 12.0
Electa chiteff.		+	Mounting and accomply dimensions.
Electr. shutoff:		I	Mounting and assembly dimensions:
1st speed 1/min:		+	Designation
Del. quantity cm3/:	0.003.00 (0.003.00)	<u> </u>	K mm: - KF mm: 5,05,4
Shutoff		+	MS $mm: 0,91,1$
electromagnet volt:	-	<u>†</u>	SVS max. mm: 2,7
Idle delivery:		Į	LDA stroke mm: 6,0 XK mm: 18,820,8
•		+	XL mm: 8,411,8

## Remarks:

: C.D.C. # 390 8191

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

Note inst. in remarks column

Test scheet : CUM 3,9 D2 Edition : 16.07.91 : 11.12.86 replaces : ISO-4113 Calibrating oil

: VE4/12F1250R231 Injection pump Type number : 0 460 424 028

Customer Part-No. :

Customer-specific information

Customer

Engine : 4 BTA 3.9 AUTO

KW: 88 Power 1/min: 2500 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer: 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

bar: 250.00...253.00 Pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

mm: 0,3Prestroke

(from BDC): +0.02(0.04)

Start of delivery block mm: 1,55 Piston stroke

mm: +0.02(0.06)

**Outlet** 

Injection pump setting values Test specifications in parentheses Timing-device travel

Speed 1/min: 850 Charge press. hPa: 1000

Setting value mm: 4.00...4.40

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 850 Speed Charge press hPa: 1000

Setting value bar: 5.60...6.20

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 850 Speed Charge press. hPa: 1000

Del. quantity cm3/ 1000s.: 85.50...86.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4.0 1000s.: (4.5)

Full-load del. w/out charge press.:

1/min: 500

Del. quantity cm3/ 1000s.: 63.50...64.50

Shutoff

electromagnet Volt: 12

Low-idle speed regulation

1/min: 365 Speed

Del. quantity cm3/

1000s.: 8.00...14.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1310 Charge press hPa: 1000

Del. quantity cm3/ 1000s.: 61.00...67.00

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 100 Del. quantity cm3/: 70.00...140.00 mind 1000s.: 70.00

electromagnet Volt:	12	‡		(40.60154.00)
Inspection-pump tes Test specifications		+	Delivery-quant. and	l breakaway char.
Timing-device chara	cteristic:	Ŧ	1nd speed 1/min:	
2nd speed 1/min: Charge press hPa: TD travel mm:	1100 1000 4.905.70	†		-setting 350 6,6
	(4.606.00)	1	electromagnet Volt: Del. quantity cm3/:	12 79 50 80 50
electromagnet Volt: 3rd speed 1/min:	850	‡	1000S.: 2nd speed 1/min:	(76.0084.00) 1420
TD travel mm:	1000 4.004.40 (3.504.90)	+	Charge press. hPa: Shutoff electromagnet Volt:	
Shutoff electromagnet Volt:	12	+	Del. quantity cm3/: 1000s.:	0.003.00 (0.003.00)
TD travel mm:	1000 1.802.60	‡	3rd speed 1/min: Charge press. hPa: Shutoff	
Shutoff electromagnet Volt:	(1.502.90)	†	electromagnet Volt: Del. quantity cm3/: 1000s:	12 0.0015.00 (0.0015.00)
Supply-pump pressur		+	4th speed 1/min: Charge press. hPa: Shutoff	1360
<u> </u>	500 1000	Ŧ	electromagnet Volt: Del. quantity cm3/:	15.0055.00
Supply-pump pressure bar: Shutoff	4.004.60	+	5th speed 1/min: Charge press. hPa:	
electromagnet Volt: 2nd speed 1/min: Charge press. hPa:	850	+++++++++++++++++++++++++++++++++++++++	Shutoff electromagnet Volt: Del. quantity cm3/: 1000s.:	12 61.0067.00
Shutoff	5.606.20	†	9th speed 1/min: Charge press. hPa:	1250
electromagnet Volt: 3rd speed 1/min: Charge press. hPa:	12 1100 1000	+	Shutoff electromagnet Volt: Del. quantity cm3/:	12 75.5078.50
Supply-pump	6.707.30	+	1000s.: 10th speed 1/min: Charge press. hPa:	(74.0080.00) 1100
electromagnet Volt:	12	Ī	Shutoff electromagnet Volt:	
Overlow quantity at	overflow valve:	<u></u>	Del. quantity cm3/:	
1st speed 1/min: Charge press. hPa: Shutoff		+	12th speed 1/min: Charge press. hPa: Shutoff	
electromagnet Volt:	41.7083.40	†	electromagnet Volt: Del. quyntity cm3/:	12 85.5086.50 (83.0089.00)
2nd speed 1/min: Charge press. hPa: Shutoff	1250	<del> </del> +	18th speed 1/min: Charge press. hPa:	500
electromagnet Volt:	12	I	Shutoff electromagnet Volt:	12

Del. quantity cm3/: 63.50...64.50 1000s.: (60.00...68.00) Mech. shutoff: Mech. Abstellung: 1st speed 1/min: 1400 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Electr. shutoff: 1/min: 365 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1st speed 1/min: 365 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 8.00...14.00 1000s.: (6.00...16.00) Dispersion cm3/: 5.5 1000s.: (7.0) 2nd speed 1/min: 450 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) Automatic starting fuel delivery: 1/min: 130 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 70.00...140.00 1000s.: (70.00...140.00) 1/min: 230 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 20.00...60.00 1000s.: (20.00...60.00) 1/min: 100 4th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 70.00...140.00

1000s.: (70.00...140.00)

: 10.0 : 12.0 Mounting and assembly dimensions: Designation

Κ mm: mm: 5,0...5,4 KF MS mm: 1,0...1,4SVS max. mm: 2,6 LDA stroke mm: 6,6 mm: 20,2...22,2 XK mm: 13,1...16.6 XL

Remarks:

: C.D.C. # 390 8195

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timingdevice-travel measuring device with metal jacket

Cut-in

min voltage

Rated voltage

Shutoff electromagnet:

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : CUM 3,9 C Test scheet Edition : 16.07.91 : 11.86 replaces : ISO-4113 Calibrating oil : VE4/12F1150R231-1 Injection pump : 0 460 424 029 Type number Customer Part-No. : Customer-specific information Customer : CDC : 4 BTA 3.9 IND. Engine KW: 82 Power 1/min: 2300 Speed TEST BENCH REQUIREMENTS Calibrating-oil with thermometer: 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar : 0.30...0.40 Calibrating nozzle-holder assembly : 1 688 901 027 Opening bar: 250.00...253.00 Pressure Perforated plate diameter mm: 0.5 Test inj. tubing : 1 680 750 017 Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length Start of delivery nm: 0.3Prestroke (from BDC): +0.02(0.04)Start of delivery block mm: 1,55 mm: +0,02(0,06)

Speed 1/min: 850 Charge press. hPa: 1000 Setting value mm: 4.00...4.40 Shutoff electromagnet Volt: 12 Supply-pump pressure 1/min: 850 Speed Charge press hPa: 1000 Setting value bar: 5.60...6.20 Shutoff electromagnet Volt: 12 Full-load del. with charge press.: 1/min: 850 Speed Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 85.50...86.50 Shutoff electromagnet Volt: 12 Dispersion cm3/: 4.0 10005.: (4.5) Full-load del. w/out charge press.: 1/min: 500 Del. quantity cm3/ 1000s.: 63.50...64.50 Shutoff electromagnet Volt: 12 Low-idle speed regulation 1/min: 375 Speed Del. quantity cm3/ 1000s.: 8.00...14.00 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0) Full-load speed regulation 1/min: 1220 Speed Charge press hPa: 1000 Del. quantity cm3/ 1000s.: 62.50...68.50 Shutoff electromagnet Volt: 12 Start: Speed 1/min: 100 Del. quantity cm3/: 60.00...130.00 1000s.: 60.00

Timing-device travel

Outlet

Piston stroke

Injection-pump setting values

Test specifications in parentheses

Shutoff electromagnet Volt:	12	<u>†</u>		55.60139.00 (40.60154.00)
Inspection-pump tes Test specifications		† †	Delivery-quant. and	breakaway char.:
Timing-device chara	cteristic:	+	1nd speed 1/min:	
2nd speed 1/min: Charge press hPa: TD travel mm: Shutoff electromagnet Volt: 3rd speed 1/min: Charge press hPa: TD travel mm: Shutoff electromagnet Volt: 4th speed 1/min: Charge press hPa: TD travel mm: Shutoff electromagnet Volt: 4th speed 1/min: Charge press hPa: TD travel mm: Shutoff electromagnet Volt: Supply-pump pressure 1st speed 1/min: Charge press hPa: Supply-pump pressure bar: Shutoff electromagnet Volt: 2nd speed 1/min: Charge press hPa: Supply-pump	1150 1000 5.206.00 (4.906.30) 12 850 1000 4.004.40 (3.504.90) 12 500 1000 1.802.60 (1.502.90) 12 e characteristic: 500 1000 4.004.60 12 850 1000 5.606.20	<del>╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸</del>	Charge-air pressure point hPa: LDA-stroke mm: Shutoff electromagnet Volt: Del. quantity cm3/: 2nd speed 1/min: Charge press. hPa: Shutoff electromagnet Volt: Del. quantity cm3/: 1000s.: 4th speed 1/min: Charge press. hPa: Shutoff electromagnet Volt: Del. quantity cm3/: 1000s.: 5th speed 1/min: Charge press. hPa: Shutoff electromagnet Volt: Del. quantity cm3/: 1000s.: 9th speed 1/min: Charge press. hPa: Shutoff electromagnet Volt: Del. quantity cm3/: 3th speed 1/min: Charge press. hPa: Shutoff electromagnet Volt: Del. quantity cm3/:	-setting 350 6,6  12 79.5080.50 (76.0084.00) 1320 1000  12 0.003.00 (0.003.00) 1260 1000  12 15.0055.00 (15.0055.00) 1220 1000  12 62.5068.50 (59.5071.50) 1150 1000  12 76.0079.00 (74.5080.50) 1000
3rd speed 1/min: Charge press. hPa: Supply-pump pressure bar: Shutoff	1150 1000 6.907.50	+++++++++++++++++++++++++++++++++++++++	electromagnet Volt: Del. quantity cm3/:	79.5082.50 (77.5084.50) 850
electromagnet Volt: Overlow quantity at		I	electromagnet Volt: Del. quyntity cm3/:	12 85.5086.50 (83.0089.00)
quantity cm3/10s:	- 12 41.7083.40 (26.7098.40)	T + + + + + + + + + + + + + + + + + + +	18th speed 1/min: Charge press. hPa: Shutoff electromagnet Volt: Del. quantity cm3/:	500 - 12
2nd speed 1/min: Charge press. hPa: Shutoff electromagnet Volt:	1000	+++++	Mech. shutoff: Mech. Abstellung:	

1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Electr. shutoff: 1st speed 1/min: 375
Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1/min: 375 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 8.00...14.00 1000s.: (6.00...16.00) cm3/: 5.5 1000s.: (7.0) Dispersion 1/min: 450 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) Automatic starting fuel delivery: 1/min: 130 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...130.00 1000s.: (60.00...130.00) 1/min: 230 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 20.00...60.00 1000s.: (20.00...60.00) 1/min: 100 4th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...130.00 1000s.: (60.00...130.00) Shutoff electromagnet: Cut-in : 10.0 min voltage : 12.0 Rated voltage Mounting and assembly dimensions:

mm: 5,1...5,3

MS mm: 1,1..1,35 SVS max. mm: 2,6 LDA stroke mm: 6,6 XK mm: 18,8...20,8 XL mm: 12,4...15,8

Remarks:

: C.D.C. # 390 9590

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

F27

KF

Designation

Note inst. in remarks column

: CUM 3,9 D1 : 16.07.91 Test scheet Edition : 11.12.86 replaces : ISO-4113 Calibrating oil

Injection pump : VE4/12F1050R230-3 : 0 460 424 033 Type number

Customer Part-No. :

Customer-specific information

Customer

: 4 BTA-390 IND Engine

KW: 79 Power 1/min: 2100 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically: 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

Pressure bar: 250.00...253.00

Perforated-plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

mm: 0,3 Prestroke

(from E0C): +0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel

1/min: 750 Speed Charge press. hPa: 1000 Setting value mm: 3.40...3.80

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 750 Speed Charge press hPa: 1000

Setting value bar: 5.00...5.60

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 900 Speed Charge press. hPa: 1000
Del. quantity cm3/
1000s.: 83.00...84.00

Shutoff

electromagnet Volt: 12 cm3/: 4.0 Dispersion 1000s.: (4.5)

Full-load del. w/out charge press.:

1/min: 500 Speed

Del. quantity cm3/

1000s.: 63.50...64.50

Shutoff

electromagnet Volt: 12

Low-idle speed regulation

1/min: 375 Speed

Del. quantity cm3/ 1000s.: 8.00...14.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1100 Speed Charge press hPa: 1000

Del. quantity cm3/ 1000s.: 59.00...65.00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100 Speed

Del. quantity cm3/: 60.00...120.00

1000s.: 60.00 mind

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

		1	Delivery-quant. and	hreakaway char.:
Timing-device chara	cteristic:	1	beervery quarter and	bi culturay chair.
TD travel mm:	1050 1000 4.705.50 (4.405.80)	+++++++++++++++++++++++++++++++++++++++		-setting
TD travel mm:	12 750 1000 3.403.80 (2.904.30)	+ + + + + + + + + + + + + + + + + + + +	Shutoff electromagnet Volt: Del. quantity cm3/: 1000s.: 2nd speed 1/min: Charge press. hPa: Shutoff	79.5080.50 (76.0084.00) 1120
TD travel mm: mm: Shutoff electromagnet Volt:	500 1000 1.702.50 (1.402.80)	<del>+ + + + + + + + + + + + + + + + + + + </del>	electromagnet Volt: Del. quantity cm3/: 1000s.: 4th speed 1/min: Charge press. hPa: Shutoff electromagnet Volt: Del. quantity cm3/:	20.0050.00 (20.0050.00) 1180 1000
	(0.001.00)	I I I	1000s.: 5th speed 1/min: Charge press. hPa:	(0.003.00) 1100
1st speed 1/min: Charge press. hPa: Supply-pump		T + + +		59.0065.00 (56.0068.00)
Shutoff electromagnet Volt: 3rd speed 1/min:	12 750	T + +	Charge press. hPa: Shutoff electromagnet Volt:	1000 12
Supply-pump	1000 5.005.60	† † † †	12th speed 1/min: Charge press. hPa:	(75.0081.00) 900
electromagnet Volt: 4th speed 1/min: Charge press. hPa: Supply-pump	1050	+++++++++++++++++++++++++++++++++++++++	Shutoff electromagnet Volt: Del. quyntity cm3/:	12
oressure bar: Shutoff electromagnet Volt:	6.306.90	+++++++++++++++++++++++++++++++++++++++	18th speed 1/min: Charge press. hPa: Shutoff electromagnet Volt:	500
Overlow quantity at		+	Del. quantity cm3/:	63.5064.50 (60.0068.00)
1st speed 1/min: Charge press. hPa: Shutoff	_	‡	Mech. shutoff: Mech. Abstellung:	
electromagnet Volt: Overflow: quantity cm3/10s: 2nd speed 1/min: Charge press. hPa: Shutoff	41.7083.40 (26.7098.40) 1050	† † † †	1st speed 1/min: Del. quantity cm3/: 1000s.: Shutoff electromagnet volt:	0.003.00 (0.003.00)
electromagnet Volt:	55.60139.00	+++++++++++++++++++++++++++++++++++++++	Electr. shutoff:  1st speed 1/min:	

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1/min: 375 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 8.00...14.00 1000s.: (6.00...16.00) Dispersion cm3/: 5.5 1000s.: (7.0) 1/min: 450 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) Automatic starting fuel delivery: 1st speed 1/min: 130 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...120.00 1000s.: (60.00...120.00) 1/min: 230 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 10.00...50.00 1000s.: (10.00...50.00) 1/min: 100 4th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...120.00 1000s.: (60.00...120.00) Shutoff electromagnet: Cut-in : 10.0 min voltage : 12.0 Rated voltage Mounting and assembly dimensions: Designation Κ mm: mm: 5,1...5,4 mm: 1,1..1,35 KF MS SVS max. mm: 2,2 mm: 20.2...22.2 mm: 11.9...15.3 XK XL Remarks: : C.D.C. # 390 9592 Operate control lever after each

G02

manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

Note inst. in remarks column

Test scheet : PER 4,0 B : 16.07.91 Edition : 08.11.88 replaces Calibrating oil : ISO-4113

: VE4/12F1400R279 Injection pump : 0 460 424 036 Type number

Customer Part-No. :

Customer-specific information Customer : PERKINS

Engine : NA 4.40 LKW

TEST BENCH REQUIREMENTS

Calibrating oil return temb.

with thermometer : 40.00...48.00 Electronically: 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 020 assembly

Opening |

bar: 172.00...175.00 Pressure

Perforated-plate

mm: 0.6 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery Prestroke mm: -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 950

Setting value mm: 2.30...2.70

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 950 Speed

Setting value bar: 5.40...6.00

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 800

Del. quantity cm3/

1000s.: 75.50...76.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 3.5 1000s.: (3.5)

Low-idle speed regulation

1/min: 300

Del. quantity cm3/

1000s.: 19.50...23.50

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 3.5 1000s.: (3.5)

Full-load speed regulation

1/min: 1600 Speed

Del. quantity cm3/

1000s.: 17.00...23.00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100 Speed

Del. quantity cm3/: 90.00...120.00

1000s.: 90.00

Shutoff

electromagnet Volt: 12

Inspection—pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed

1/min: 1400 mm: 2.90...3.70 TD travel

mm: (2.60...4.00)

Shutoff

electromagnet Volt: 12 1/min: 950 3rd speed

mm: 2.30...2.70 TD travel mm: (1.80...3.20)

Shutoff

electromagnet Volt: 12 1/min: 800 4th speed

	0.501.10	+	Shutoff
	(0.101.50)	+	electromagnet Volt: 12
Shutoff		+	Del. quantity cm3/: 69.0072.00
electromagnet Volt:	12	+	1000s.: (67.5073.50)
		+	11th speed
Supply-pump pressur	e characteristic:	+	Shutoff
		+	electromagnet Volt: 12
1st speed 1/min:	800	+	Del. quantity cm3/: 74.8077.20 1000S.: (73.0079.00)
Supply-pump		+	1000s.: (73.0079.00)
pressure bar:	4.805.40	+	12th speed
Shutoff		+	Shutoff
electromagnet Volt:	. 12	+	electromagnet Volt: 12
2nd speed 1/min:	95 <u>0</u>	+	Del. quyntity cm3/: 75.5076.50
Supply-pump		4	1000S.: (73.0079.00)
pressure bar:	5.406.00	+	20th speed 1/min: 500
Shutoff		1	Shutoff
electromagnet Volt:	12	1	electromagnet Volt: 12
3rd speed 1/min:	1400	1	Del. quantity cm3/: 65.5068.50
Supply-pump	1 100	1	1000s.: (64.0070.00)
pressure bar:	7,207.80	1	1000011 (#110011110100)
Shutoff	7.20.2.7.400	1	Mech. shutoff:
electromagnet Volt:	12	1	Mech. Abstellung:
4th speed 1/min:	ร่กัก	1	ricult. Above cong.
Supply-pump	200	1	1st speed 1/min: 1400
pressure bar:	3.404.00	1	Del. quantity cm3/: 0.003.00
Shutoff	3.404.00	Ι	1000\$.: (0.003.00)
electromagnet Volt:	12	T	Shutoff
etetti dilagnet vott.	ñ- <b>€</b>	T	
Overlay avantity of	overflow volves	T	electromagnet volt: 12
Overlow quantity at	overitow valve:	T	Electr chutoff.
1-4	F00	<b>T</b>	Electr. shutoff:
1st speed 1/min:	200	†	Ant 1
Shutoff	12	†	1st speed 1/min: 300
electromagnet Volt:	14 70 07 10	†	Del. quantity cm3/: 0.003.00
Overflow:	41.7085.40	†	1000s.: (0.003.00)
quantity cm3/10s:	(20.7098.40)	†	Shutoff
2nd speed 1/min:	1400	†	electromagnet volt: -
Shutoff	12	+	<b>+</b> .11
electromagnet Volt:	12	†	Idle delivery:
	55.60139.00	†	4
quantity cm3/10s:	(40.60154.00)	+	1st speed 1/min: 300
- 1 •		+	Shutoff
Delivery-quant. and	breakaway char.:	+	electromagnet Volt: 12
		<b>†</b>	Del. quantity cm3/: 19,5023.50
	4440	+	1000§.: (16.5026.50)
3rd speed 1/min:	1660	+	Dispersion cm3/: 3.5
Shutoff		+	1000s.: (3.5)
electromagnet Volt:		+	2nd speed 1/min: 350
Del. quantity cm3/:	0.003.00	+	Shutoff
	(0.003.00)	+	electromagnet Volt: 12
5th speed 1/min:	1600	+	Del. quantity cm3/: 14.5020.50
Shutoff		+	1000s.: (12.5022.50)
electromagnet Volt:	12.	+	4th speed 1/min: 400
Del. quantity cm3/:	17.0023.00	+	Shutoff
1000s.:	(15.0026.00)	+	electromagnet Volt: 12
8th speed 1/min:	1500	+	Del. quantity cm3/: 5.0012.00
Shutoff		+	1000s.: (4.5012.50)
electromagnet Volt:	12	+	
Del. quantity cm3/:		+	Automatic starting fuel delivery:
1000s.:	(52.0062.00)	+	<b>.</b>
9th speed 1/min:		+	1st speed 1/min: 150
•		•	•

G04

Shutoff electromagnet Volt: 12 Del. quantity cm3/: 100.00...130.00 1000s.: (100.00...130.00) 1/min: 250 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 35.00...65.00 1000s.: (35.00...65.00) 1/min: 100 4th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 90.00...120.00 1000s.: (90.00...120.00) Shutoff electromagnet: Cut-in min voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation mm: 3,2...3,4 mm: K-OT Κ KF mm: 1,1...1,5 mm: 17,0...19.0 MS XK mm: 9,6...13,0XL Remarks: :

Note inst. in remarks column

Test scheet : CAS 3,9 M3 Edition : 16.07.91

replaces

Calibrating oil : ISO-4113

: VE4/12F1100R310 Injection pump : 0 460 424 042 Type number

Customer Part-No. :

Customer-specific information

Customer : CASE

: 4BT-3.9 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250.00...253.00 Pressure

Perforated plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery

mm: 0.3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1,8

mm: +-0.02(0.06)

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 750 Charge press. hPa: 1000

Setting value mm: 2.10...2.50

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 750 Speed Charge press hPa: 1000

Setting value bar: 4.20...4.80

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 750 Speed Charge press. hPa: 1000

Del. quantity cm3/ 1000s.: 72.00...73.00

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4.0 1000s.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500

Del. quantity cm3/

1000s.: 45.50...46.50

Shutoff

electromagnet Volt: 12

Low-idle speed regulation

1/min: 450 Speed

Del. quantity cm3/

1000s.: 8.50...14.50

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1170 Speed Charge press hPa: 1000

Del. quantity cm3/

100ōs.: 47.00...53.00

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 100 Del. quantity cm3/: 60.00...120.00

1000s.: 60.00

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses Delivery-quant. and breakaway char.: 1nd speed 1/min: 700\* Timing-device characteristic: Charge-air pressure-setting point hPa: 325 LDA-stroke mm: 6,5 1/min: 900 hPa: 1000 mm: 2.80...3.60 mm: (2.50...3.90) 2nd speed Charge press Shutoff TD travel Shutoff electromagnet Volt: 12 3rd speed 1/min: 750 Charge press. hPa: 1000 Shutoff Charge press hPa: 1000 TD travel mm: 2.10...2.50 mm: (1.60...3.00) electromagnet Volt: 12 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet Volt: 12 4th speed 1/min: 600 ord speed 1/min: 1230 Charge press. hPa: 1000 Shutoff hPa: 1000 Charge press TD travel mm: 0.80...1.60 electromagnet Volt: 12 Del. quantity cm3/: 0.00...15.00 1000s.: (0.00...15.00) mm: (0.50...1.90) Shutoff electromagnet Volt: 12 1/min: 1180 4th speed Charge press. hPa: 1000 Shutoff Supply-pump pressure characteristic: electromagnet Volt: 12
Del. quantity cm3/: 15.00...55.00
1000S.: (15.00...55.00)
5th speed 1/min: 1170
Charge press. hPa: 1000
Shutoff 1st speed 1/min: 500 Charge press. hPa: 1000 Supply-pump bar: 3.10...3.70 pressure Shutoff electromagnet Volt: 12 2nd speed 1/min: 750 electromagnet Volt: 12 Del. quantity cm3/: 47.00...53.00 Charge press. hPa: 1000 1000s.: (44.00...56.00) Supply-pump 1/min: 1100 bar: 4.20...4.80 9th speed pressure Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1100 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12
Del. quantity cm3/: 62.00...65.00
1000S.: (60.50...66.50)
10th speed 1/min: 900 Supply-pump pressure bar: 5.80...6.40 Shutoff Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 electromagnet Volt: 12 Del. quantity cm3/: 63.50...68.50 Overlow quantity at overflow valve: 1000s.: (62.00...70.00) 1/min: 750 1st speed 1/min: 500 12th speed Charge press. hPa: 1000 Shutoff Charge press. hPa: -Shutoff electromagnet Volt: 12
Del. quyntity cm3/: 72.00...73.00
1000S.: (69.50...75.50)
18th speed 1/min: 500 electromagnet Volt: 12 Overflow: 41.70...83.40 quantity: cm3/10s: (26.70...98.40) 1/min: 1100 2nd speed Charge press. hPa: -Shutoff Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 45.50...46.50 1000s.: (42.00...50.00) electromagnet Volt: 12 : 55.60...139.00 Overflow quantity cm3/10s: (40.60...154.00)

Mech. shutoff: Mech. Abstelluna: 1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Electr. shutoff: 1st speed 1/min: 450 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1st speed 1/min: 450 Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 8.50...14.50 1000S.: (6.50...16.50) cm3/: 5.5 Dispersion

1000s.: (7.0) 1/min: 550 2nd speed Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00)

1/min: 375 3rd speed Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 30.00...38.00

1000s.: -

Automatic starting fuel delivery:

1/min: 250 1st speed Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 55.00...115.00 1000s.: (55.00...115.00)

1/min: 400

2nd speed Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 15.00...65.00 1000s.: (15.00...65.00)

1/min: 100 4th speed Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 60.00...120.00

1000s.: (60.00...120.00)

Shutoff electromagnet:

Cut-in

: 10.0 min voltage : 12.0 Rated voltage

Mounting and assembly dimensions:

Designation

Κ mm: -

mm: 5,0...5,4 mm: 1,2...1,6 KF MS mm: 2,5 mm: 18,8...20,8 mm: 11,7...15,1 SVS max. XK XL

Remarks:

: C.D.C. # 391 1190

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

Note inst. in remarks column

: CAS 3,9L : 16.07.91 Test scheet Edition : 31.01.89 replaces Calibrating oil : ISO-4113

: VE4/12F1100R310-1 Injection pump Type number : 0 460 424 043

Customer Fart-No.

Customer-specific information Customer

Engine : 4 TA 390 /66KW

Power KW: 66 1/min: 2200 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250.00...253.00 Pressure

Perforated-plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Start of delivery block mm: 1,55 Piston stroke

mm: +-0.02(0.06)

Outlet

Injection-pump setting values Test specifications in parentheses Timing-device travel

1/min: 750 Speed Setting value mm: 3.20...3.60

Shutoff

electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750

Setting value bar: 4.30...4.90

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 750 Speed

Del. quantity cm3/ 1000s.: 85.00...86.00

Shutoff

electromagnet Volt: 12 cm3/: 4.0 Dispersion 1000s.: (4.5)

Low-idle speed regulation

1/min: 450 Speed

Del. quantity cm3/

1000s.: 10.00...16.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000S.: (7.9)

Full-load speed regulation

1/min: 1155 Speed

Del. quantity cm3/ 1000s.: 50.00...58.00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100

Del. quantity cm3/: 70.00...120.00 mind 1000s.: 70.00

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100

mm: 4.80...5.60 TD travel

mm: (4.50...5.90)

Shutoff		+	Shutoff
electromagnet Volt:	12_	+	electromagnet Volt: 12
3rd speed 1/min:		+	Del. quantity cm3/: 50.0058.00
TD travel mm:	3.203.60	+	1000\$.: (46.0062.00)
	(2.704.10)	+	9th speed 1/min: 1100
Shutoff		+	Shutoff
electromagnet Volt:	12	+	electromagnet Volt: 12
4th speed 1/min:		+	Del. quantity cm3/: 68.0071.00
	1.602 <i>.</i> 40	+	1000s.: (66.5072.50)
mm:	(1.302.70)	+	10th speed 1/min: 900
Shutoff		+	Shutoff
electromagnet Volt:	12	+	electromagnet Volt: 12
_		+	Del. quantity cm3/: 75.0078.00 1000s.: (73.0080.00)
Supply-pump pressure	characteristic:	+	1000s.: (73.0080.00)
	·	+	12th speed
1st speed 1/min: 1	500	+	Shutoff
Supply-pump	•	+	electromagnet Volt: 12
pressure bar:	3.203.80	+	Del. quyntity cm3/: 85.0086.00
Shutoff		+	1000s.: (82.5088.50)
electromagnet Volt: 1	12	+	20th speed 1/min: 500
2nd speed 1/min:	750	+	Shutoff
Supply-pump		1	electromagnet Volt: 12
pressure bar:	4.304.90	1	Del. quantity cm3/: 85.0093.00
Shutoff		1	1000s.: (83.0095.00)
electromagnet Volt:	12	1	
3rd speed 1/min:		1	Mech. shutoff:
Supply-pump		1	
pressure bar:	5.806.40	1	Electr. shutoff:
Shutoff		1	
electromagnet Volt:	12	1	1st speed 1/min: 450
crest and rot focts	••	1	Del. quantity cm3/: 0.003.00
Overlow quantity at o	overflow valve:	1	10005.: (0.003.00)
over com quarterey are	over real vacve.	1	Shutoff
1st speed 1/min:	SÃN	1	electromagnet volt: -
Shutoff	300	1	o coo crosinagi lo crocce
electromagnet Volt:	12	1	Idle delivery:
Overflow : 4	41.7083.40	1	2400 400, 101, 1
quantity cm3/10s:		1	1st speed 1/min: 450
2nd speed 1/min:		1	Shutoff
Shutoff		1	electromagnet Volt: 12
electromagnet Volt:	12	+	Del. quantity cm3/: 10.0016.00
Overflow : 5	55.60139.00	1	1000s.: (8.0018.00)
quantity cm3/10s:		1	Dispersion cm3/: 5.5
quarterey ones ros.	(40.001541.40)	1	10008.: (7.0)
Delivery quant. and k	oreakaway char	1	2nd speed 1/min: 500
beenvery quarter and a	or caranay onar	1	Shutoff
		1	electromagnet Volt: 12
2nd speed 1/min: 1	1215	1	Del. quantity cm3/: 0.004.00
Shutoff	1213	1	10008.: (0.004.00)
electromagnet Volt: 1	12	1	10000:. (5:00:4:00)
Del. quantity cm3/: 0		Ι	Automatic starting fuel delivery:
	(0.003.00)	Ι	Automatic Starting ruet detivery.
3rd speed 1/min: 1		Ι	1st speed 1/min: 250
Shutoff	1110	I	Shutoff
electromagnet Volt: 1	12	I	electromagnet Volt: 12
Del. quantity cm3/: 1	in വെ പ്രവ	1	Del. quantity cm3/: 85.00135.00
1000 · /	(10.0060.00)	I	1000S.: (85.00135.00)
Shutoff	(10.0000.00)	I	1000(0).00(3).00
electromagnet Volt: 1	12	I	2nd speed 1/min: 450
5th speed 1/min: 1	1155	I	LIM Speed 1/11/11. 450
		,	

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 70.00...100.00 1000S.: (70.00...100.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 12
Del. quantity cm3/: 70.00...120.00
1000S.: (70.00...120.00)

### Shutoff electromagnet:

Cut-in

: 10.0 : 12.0 min voltage Rated voltage

Mounting and assembly dimensions:

Designation

K KF mm: -

MS

SVS max.

mm: 5,0...5,4 mm: 0,8...1,2 mm: 1,3 mm: 18,1...20,8 mm: 9,9...13,3 XK

XL

Remarks:

: C.D.C. # 391 2111

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : CUM 3,9 P16 : 16.07.91 : 23.04.90 Test scheet Edition replaces Calibrating oil : ISO-4113 : VE4/12F1250R359-1 : 0 460 424 055 Injection pump Type number Customer Part-No. : Customer-specific information Customer : CDC : 4 BT- 390 AUTOM. Engine KW: 77 1/min: 2500 Power Speed TEST BENCH REQUIREMENTS Overflow restricti: 1 463 456 303 Calibrating-oil return temp. with thermometer : 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar: 0.30...0.40 Calibrating nozzle-holder : 1 688 901 027 assembly Opening bar: 250.00...253.00 Pressure Perforated-plate mm: 0.5 diameter Test inj. tubing : 1 680 750 017 Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length Start of delivery Prestroke mm: -(from BDC): -Start of delivery block mm: 1,0 Piston stroke mm: +0,02(0,06)Outlet : A

Test specifications in parentheses Timing-device travel Speed 1/min: 1100 Charge press. hPa: 1000 Setting value mm: 1.90...2.30 AFB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 Supply-pump pressure Speed 1/min: 1100 Charge press hPa: 1000 Setting value bar: 5.40...6.00 KSB/AFB Volt: 12 valve Shutoff electromagnet Volt: 12 Full-load del. with charge press.: 1/min: 850 Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 73.00...74.00 KSB/AFB valve Volt: 12 Shutoff electromagnet Volt: 12 cm3/: 4.0 Dispersion 1000s.: (4.5) Full-load del. w/out charge press.: 1/min: 500 Speed Del. quantity cm3/ 1000s.: 43.50...44.50 KSB/AFB 11 valve Volt: 12 Shutoff electromagnet Volt: 12 Low-idle speed regulation 1/min: 350 Del. quantity cm3/ 1000s.: 7.50...11.50 KSB/AFB Volt: 12 valve Shutoff electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0) Full-load speed regulation 1/min: 1340 Speed

Injection-pump setting values

Charge press hPa: Del. quantity cm3/	1000	<u>†</u>	Supply-pump pressure bar:	2.703.30
1000s.:	54.0060.00	1	KSB/AFB	2.105.50
KSB/AFB		+	valve Volt:	12
valve Volt:	12	+	Shutoff	40
Shutoff	10	+	electromagnet Volt:	12
electromagnet Volt:	12	Ī	2nd speed 1/min: Charge press. hPa:	1000
Start:		Į	Supply-pump	
		+	pressure bar:	4.405.00
Speed 1/min:	100	+	KSB/AFB	40
Del. quantity cm3/:	90.00170.00	†	valve Volt: Shutoff	12
mind 1000s.: KSB/AFB	90.00	Ι	electromagnet Volt:	12
Valve Volt:	12	1	3rd speed 1/min:	1100
Shutoff		+	Charge press. hPa:	1000
electromagnet Volt:	12	+	Supply-pump	
_		+	pressure bar:	5.406.00
Inspection pump tes	t specifications	+	KSB/AFB	40
Test specifications	in parentheses	†	valve Volt:	12
Timing-device chara	otonictic:	Ť	Shutoff electromagnet Volt:	12
Tilling device chara	cter istic.	I	4th speed 1/min:	1250
2nd speed 1/min:	1250	1	Charge press. hPa:	1000
Charge press hPa:	1000	+	Supply-pump	
TD travel mm:	2.903.70	+	pressure bar:	6.006.60
mm:	(2.604.00)	+	KSB/AFB	40
KSB/AFB	42	+	valve Volt:	12
valve Volt: Shutoff	12	†	Shutoff	12
electromagnet Volt:	12	I	electromagnet Volt:	14
3rd speed 1/min:	1100	1	Overlow quantity at	overflow valve:
	1000	+	ovo. con quarrovo, ar	
TD travel mm:	1.902.30	+	1st speed 1/min:	500
	(1.402.80)	+	Charge press. hPa:	-
KSB/AFB	12	+	KSB/AFB	10
valve Volt:	12	+	valve Volt: Shutoff	12
Shutoff electromagnet Volt:	12	I	electromagnet Volt:	12
4th speed 1/min:	900	1	Overflow :	41.7083.40
Charge press hPa:	1000	+	quantity cm3/10s:	(26.7098.40)
TD travel mm:	0.701.50	+	2nd speed 1/min:	1250
	(0.401.80)	+	Charge press. hPa:	1000
KSB/AFB	13	+	KSB/AFB	40
valve Volt: Shutoff	12	Ť	valve Volt: Shutoff	12
electromagnet Volt:	12	I	electromagnet Volt:	12
8th speed 1/min:		1	Overflow :	55.60139.00
Charge press. hPa:	_	+	quantity cm3/10s:	(40.60154.00)
TD travel mm:	2.703.70	+	· .	
KSB/AFB		+	Delivery-quant. and	breakaway char.:
valve Volt:	-	+		
Shutoff	10	Ť	1nd speed 1/min:	700+
electromagnet Volt:	16	I	Charge-air pressure	
Supply-pump pressure	e characteristic:	1	point hPa:	
		+		6,4
1st speed 1/min:		+	KSB/AFB	•
Charge press. hPa:	1000	+	valve Volt:	12
		+		

Shutoff	+	Shutoff	
electromagnet Volt: 12	+	electromagnet volt:	12
Del. quantity cm3/: 71.007	2.00 +	KSB/AFB	40
1000s.: (67.50	75.50) +	valve Volt:	12
2nd speed 1/min: 1500	t	F1 11	
Charge press. hPa: 1000	†	Electr. shutoff:	
KSB/AFB	†	4 - 1 1 4 / 2	700
valve Volt: 12	†	1st speed 1/min:	
Shutoff	<b>†</b>	Del. quantity cm3/:	0.00
electromagnet Volt: 12	oo T		(0.003.00)
Del. quantity cm3/: 0.003.	ω, †	Shutoff	_
1000s.: (0.003 3rd speed 1/min: 1400	.007	electromagnet volt:	_
Charge press. hPa: 1000	I	Idle delivery:	
KSB/AFB	1	rate detivery.	
valve Volt: 12	1	1st speed 1/min:	350
Shutoff	1	KSB/AFB	330
electromagnet Volt: 12	1	valve Volt:	12
Del. quantity cm3/: 15.005	5.00 4	Shutoff	
1000s.: (15.00	55.00)	electromagnet Volt:	12
5th speed 1/min: 1340	+	Del. quantity cm3/:	7.5011.50
Charge press. hPa: 1000	+	1000s.:	(4.5014.50)
KSB/AFB	+	Dispersion cm3/:	
valve Volt: 12	+	1000s.:	
Shutoff	+	2nd speed 1/min:	400
electromagnet Volt: 12	+	KSB/AFB	
Del. quantity cm3/: 54.006 1000s.: (51.00	0.00 +	valve Volt:	12
100	63.00) +	Shutoff	40
9th speed 1/min: 1250	+	electromagnet Volt:	
Charge press. hPa: 1000	†	Del. quantity cm3/:	
KSB/AFB	†	10005.:	(0.006.00)
valve Volt: 12	†	Automotic stanting	fuel delivery.
Shutoff electromagnet Volt: 12	I	Automatic starting	ruet detivery.
Del. quantity cm3/: 68.507	1 50 I	1st speed 1/min:	150
1000s.: (67.00)	73 nn I	KSB/AFB	100
12th speed 1/min: 850	1	valve Volt:	12
Charge press. hPa: 1000	1	Shutoff	12
KSB/AFB	1	electromagnet Volt:	12
valve Volt: 12	+	Del. quantity cm3/:	80.00160.00
Shutoff	+	1000s.:	(80.00160.00)
electromagnet Volt: 12	+		
Del. quyntity cm3/: 73.007	4.00 <del> </del>	2nd speed 1/min:	280
1000s.: (70.50)	76.50) <del> </del>	KSB/AFB	
18th speed 1/min: 500	+	valve Volt:	12
Charge press. hPa: -	+	Shutoff	
KSB/AFB	+	electromagnet Volt:	12
valve Volt: 12	+	Del. quantity cm3/:	0.0080.00
Shutoff	+	1000S.:	(0.0080.00)
electromagnet Volt: 12	, 50	/ + h = 1	400
Del. quantity cm3/: 43.504	†	4th speed 1/min:	100
1000s.: (40.00	+0.007	KSB/AFB valve Volt:	12
Mach shutoff.	Ī	valve Volt: Shutoff	14
Mech. shutoff: Mech. Abstellung:	I	electromagnet Volt:	12
meen. Abstacturig.	I	Del. quantity cm3/:	90 00 170 00
1st speed 1/min: 1250	I	1000	(90.00170.00)
Del. quantity cm3/: 0.003.0	nn I	10000	(70.00)
10008.: (0.003	$\tilde{0}$ 00) $\downarrow$	Shutoff electromagne	et:
	1	The second straining is	<del></del>
	· ·		

Cut-in

min voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3,6...3,8
KF mm: K-OT
MS mm: 1,3...1,7
SVS max. mm: 2,7
LDA stroke mm: 6,4

LDA stroke mm: 6,4 mm: 21,8...23,8 XL mm: 11,7...15,1

Operate control lever after each manifold pressure compensator pressure change. : C.D.C. # 391 1242

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No. ..303

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

\* Unscrew KSB ball valve 2 mm

Note inst. in remarks column

: CUM 3,9 P26 Test scheet : 16.07.91 Edition replaces : 21.06.90 Calibrating oil : ISO-4113

Injection pump : VE4/12F1000R378-1 Type number : 0 460 424 059

Customer Part-No. :

Customer-specific information Customer : CASE

: 4 BTA 3.9 IND. Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically: 42.00...50,00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

bar: 250.00...253.00 Pressure

Perforated plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery

mm: 0.3 Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1,8

mm: +0,02(0,06)

**Outlet** 

Injection pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 900 Setting value mm: 2.40...2.80

Shutoff

electromagnet Volt: 24

Supply-pump pressure

1/min: 900

Setting value bar: 4.00...4.60

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

1/min: 900 Speed

Del. quantity cm3/ 1000s.: 69.00...70.00

Shutoff

electromagnet Volt: 24 cm3/: 4.0 Dispersion 1000s.: (4.5)

Low-idle speed regulation

1/min: 450 Speed

Del. quantity cm3/ 1000S.: 7.00...13.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1050

Del. quantity cm3/

1000s.: 37.50...43.50

Shutoff

electromagnet Volt: 24

Start:

Speed 1/min: 100 Del. quantity cm3/: 70.00...110.00

mind 1000s.: 70.00

Shutoff

electromagnet Volt: 24

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed

1/min: 1000 mm: 2.70...3.50 TD travel

mm: (2.40...3.80)

Shutoff

electromagnet Volt: 24 1/min: 900 3rd speed

	2.402.80 (1.903.30)	‡	Shutoff electromagnet Volt:	24
Shutoff electromagnet Volt:		<u> </u>	Del. quantity cm3/:	
4th speed 1/min:	750	1	10th speed 1/min:	
TD travel mm:	1.302.10 (1.002.40)	+	Shutoff	
Shutoff	(1.002.40)	I	electromagnet Volt: Del. quantity cm3/:	72.5075.50
electromagnet Volt:	24	+	1000s.:	(70.5077.50)
Supply-pump pressure	e characteristic:	İ	12th speed 1/min: Shutoff electromagnet Volt:	
1st speed 1/min: Supply-pump	500	I	Del. quyntity cm3/:	69.0070.00 (66.5071,50)
pressure bar: Shutoff	2.202.80	+	20th speed 1/min: Shutoff	
electromagnet Volt:	24	+	electromagnet Volt:	24
2nd speed 1/min: Supply-pump	900	#	Del. quantity cm3/:	71.5079.50 (69.5081.50)
pressure bar: Shutoff	4.004.60	1	Mech. shutoff:	(0).300;.30
electromagnet Volt:	24	+	Mech. Abstellung:	
3rd speed 1/min: Supply-pump	1000	İ	1st speed 1/min:	1000
pressure bar: Shutoff	4.405.00	Ī	Del. quantity cm3/:	0.003.00 (0.003.00)
electromagnet Volt:	24	+	Shutoff	
Overlow quantity at	overflow valve:	‡	electromagnet volt:	24
1st speed 1/min: Shutoff	500	Ī	Electr. shutoff:  1st speed 1/min:	<b>45</b> Ω
electromagnet Volt:	24	+	Del. quantity cm3/:	0.003.00
Overflow :		†		(0.003.00)
quantity cm3/10s: 2nd speed 1/min: Shutoff	1000	Ī	Shutoff electromagnet volt:	_
electromagnet Volt:	24	Ŧ	Idle delivery:	
Overflow :	55.60139.00	+	1 - t 1	/50
quantity cm3/10s:	(40.60154.00)	1	1st speed 1/min: Shutoff	450
Delivery-quant. and	breakaway char.:	+	electromagnet Volt:	
		1	Del. quantity cm3/:	7.0013.00 (5.0015.00)
2nd speed 1/min: Shutoff	1130	+	Dispersion cm3/: 1000S.:	5.5
electromagnet Volt:	24	+	2nd speed 1/min:	500
Del. quantity cm3/:	0.003.00	+	Shutoff	21
	(0.003.00)	†	electromagnet Volt:	
3rd speed 1/min: Shutoff		Ŧ	Del. quantity cm3/: 1000s.:	(0.004.00)
electromagnet Volt:		+		S. 1 1 1 • .
Del. quantity cm3/:	15.0045.00 (15.0045.00)	<b>†</b>	Automatic starting f	uel delivery:
5th speed 1/min: Shutoff		<u> </u>	1st speed 1/min: Shutoff	130
electromagnet Volt:	24	+	electromagnet Volt:	
Del. quantity cm3/:	37.5043.50	+	Del. quantity cm3/:	95.00135.00
9th speed 1/min:	(34.5046.50)	1	10005.:	(95.00135.00)

G17

1/min: 240 2nd speed

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 55.00...85.00 1000S.: (55.00...85.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 70.00...110.00 1000S.: (70.00...110.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0 : 12.0 Rated voltage

Mounting and assembly dimensions:

Designation

K mm: -

mm: 5,0...5,4 mm: 1,1...1,5 mm: 3,0 KF MS SVS max.

Remarks:

: C.D.C. # 391 7027

Heavy-duty fuel-injection pump for DI-engines: only test using timingdevice-travel measuring device with metal jacket

Note inst. in remarks column

Test scheet : CUM 3,9 P40

Edition : 12.07.91

replaces

Calibrating oil : ISO-4113

: VE4/12F1250R378-2 Injection pump

Type number : 0 460 424 060 Customer Part-No. : 3 917 029

Customer-specific information

Customer

: 4 BT 3.9 Engine

Speed 1/min: 1250

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00

Electronically : 42.00...50,00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina |

bar: 250.00...253.00 Pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840

x Length

Start of delivery

mm: 0,3Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke mm: 1,8

mm: +-0.02(0.06)

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel

1/min: 900 Speed

Setting value mm: 2.00...2.40

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 900

Setting value bar: 4.60...5.20

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 1100 Speed

Del. quantity cm3/

1000s.: 57.50...58.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4.0

1000s.: (4.5)

Low-idle speed regulation

1/min: 335

Del. quantity cm3/ 1000s.: 8.00...14.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1300 Speed

Del. quantity cm3/

1000s.: 40.00...46.00

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 100 Del. quantity cm3/: 70.00...120.00 mind 1000s.: 70.00

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed

1/min: 1100 mm: 2.90...3.70 TD travel

mm: (2.60...4.00)

Shutoff

electromagnet Volt: 12 3rd speed 1/min: 900

mm: 2.00...2.40 TD travel Shutoff mm: (1.50...2.90)Shutoff 5th speed electromagnet Volt: 12 4th speed 1/min: 750 Shutoff mm: 0.80...1.60 mm: (0.50...1.90) TD travel Shutoff 9th speed electromagnet Volt: 12 Shutoff Supply-pump pressure characteristic: 1/min: 500 1st speed Supply-pump Shutoff bar: 2.70...3.30 pressure Shutoff electromagnet Volt: 12 2nd speed 1/min: 900 2nd speed 12th speed Supply-pump Shutoff bar: 4.60...5.20 pressure Shutoff electromagnet Volt: 12 3rd speed 1/min: 1100 Supply-pump Shutoff electromagnet Volt: 12 Del. quantity cm3/: 49.00...57.00 1000s.: (47.00...59.00) bar: 5.40...6.00 pressure Shutoff electromagnet Volt: 12 1/min: 750 4th speed Supply-pump Mech. shutoff: bar: 3.90...4.50 pressure Mech. Abstellung: Shutoff electromagnet Volt: 12 Overlow quantity at overflow valve: Shutoff 1st speed 1/min: 500 electromagnet volt: 12 Shutoff electromagnet Volt: 12 Electr. shutoff: : 41.70...83.40 Overflow cm3/10s: (26.70...98.40) 1/min: 1250 quantity 2nd speed 1000s.: (0.00...3.00) Shutoff electromagnet Volt: 12 Overflow : 55.60...139.00 Shutoff electromagnet volt: cm3/10s: (40.60...154.00) quantity Idle delivery: Delivery-quant. and breakaway char.: 1/min: 335 1st speed Shutoff 1/min: 1460 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) 1/min: 1330 1/min: 500 3rd speed 2nd speed Shutoff Shutoff electromagnet Volt: 12 Del. quantity cm3/: 15.00...55.00 1000s.: (15.00...55.00) electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00)

# Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 75.00...125.00 1000S.: (75.00...125.00)

2nd speed 1/min: 300

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 40.00...80.00 1000S.: (40.00...80.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 70.00...120.00 1000S.: (70.00...120.00)

### Shutoff electromagnet:

Cut-in

: 10,0 min voltage : 12.0 Rated voltage

### Mounting and assembly dimensions:

### Designation

K mm: -

mm: 5,0...5,4 mm: 0,8...1,2 KF MS

SVS max. mm: 4,8

#### Remarks:

Heavy-duty fuel-injection pump for DI-engines: only test using timingdevice-travel measuring device with

metal jacket

Note inst. in remarks column

: CUM 3,9 N27 Test scheet : 12.07.91 Edition

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R378-4 Type number : 0 460 424 062 Customer Part-No. : 3 917 032

Customer-specific information

: CDC Customer

: 4 BT 3.9 IND. Engine

KW: 59 Power 1/min: 2200 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer: 40.00...48.00 Electronically: 42.00...50,00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina

bar: 250.00...253.00 Pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +0,02(0,04)

Start of delivery block Piston stroke mm: 1,8

mm: +0.02(0.06)

Outlet |

Injection pump setting values Test specifications in parentheses Timing-device travel

1/min: 900 Speed

Setting value mm: 2.30...2.70

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 900 Speed

Setting value bar: 4.10...4.70

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 900 Speed

Del. quantity cm3/

1000s.: 58.50...59.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4.0 1000s.: (4.5)

Low-idle speed regulation

1/min: 375

Del. quantity cm3/ 1000s.: 8.00...14.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1150 Speed

Del. quantity cm3/

1000s.: 45.00...51.00

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 110

Del. quantity cm3/: 50.00...100.00 mind 1000s.: 50.00

mind

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1100 2nd speed

mm: 3.10...3.90 TD travel mm: (2.80...4.20)

Shutoff

electromagnet Volt: 12

1/min: 1100 3rd speed 1/min: 900 9th speed mm: 2.30...2.70 mm: (1.80...3.20) TD travel Shutoff Shutoff electromagnet Volt: 12 4th speed 1/min: 750 mm: 1.30...2.10 mm: (1.00...2.40) TD travel Shutoff Shutoff electromagnet Volt: 12 12th speed Shutoff Supply-pump pressure characteristic: 1st speed 1/min: 500 Supply-pump pressure bar: 2.30...2.90 Shutoff Shutoff electromagnet Volt: 12 Del. quantity cm3/: 50.00...58.00 1000s.: (48.00...60.00) electromagnet Volt: 12 2nd speed 1/min: 900 Supply-pump pressure bar: 4.10...4.70 Shutoff Mech. shutoff: electromagnet Volt: 12 3rd speed 1/min: 1100 Mech. Abstellung: Supply-pump bar: 4.90...5.50 pressure Shutoff electromagnet Volt: 12 Shutoff electromagnet volt: 12 Overlow quantity at overflow valve: Electr. shutoff: 1/min: 500 1st speed Shutoff electromagnet Volt: 12 : 41.70...83.40 cm3/10s: (26.70...98.40) 1/min: 1100 Overflow quantity Shutoff 2nd speed electromagnet volt: -Shutoff electromagnet Volt: 12 Idle delivery: : 55.60...139.00 Overflow cm3/10s: (40.60...154.00) 1/min: 375 quantity 1st speed Shutoff electromagnet Volt: 12

Del. quantity cm3/: 8.00...14.00

1000s.: (6.00...16.00)

Dispersion cm3/: 5.5

1000s.: (7.0)

2nd speed 1/min: 550 Delivery-quant. and breakaway char.: 2nd speed Shutoff 1/min: 1250 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) 3rd speed Shutoff Automatic starting fuel delivery: 1st speed Shutoff 5th speed Shutoff 1/min: 130 electromagnet Volt: 12 Del. quantity cm3/: 80.00...120.00 1000s.: (80.00...120.00) electromagnet Volt: 12 Del. quantity cm3/: 45.00...51.00 1000S.: (42.00...54.00)

1/min: 240 2nd speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 40.00...80.00 1000s.: (40.00...80.00)

1/min: 110 4th speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 50.00...100.00 1000S.: (50.00...100.00)

Shutoff electromagnet:

Cut-in

: 10,0 : 12,0 min voltage Rated voltage

Mounting and assembly dimensions:

Designation

K mm: -

mm: 5,0...5,4 mm: 1,1...1,5 mm: 3,2 KF MS

SVS max.

Remarks:

G24

Note inst. in remarks column

Test scheet : CUM 3,9 N24 Edition : 12.07.91 : 31.10.90 replaces Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R378-4 Type number : 0 460 424 062

Customer Part-No.: 3 917 554

Customer-specific information

Customer : CDC

: 4 BT 3.9 IND. Engine

Power KW: 68 1/min: 2200 Speed

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil return temp.

with thermometer: 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250.00...253.00 Pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1,8

mm: +0,02(0,06)

Outlet

Injection-pump setting values Test specifications in parentheses Timing-device travel

1/min: 900 Speed

Setting value mm: 2.30...2.70

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 900 Speed

Setting value bar: 4.10...4.70

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 900 Speed

Del. quantity cm3/

1000s.: 68.00...69.00

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4.0 1000s.: (4.5)

Low-idle speed regulation

Speed 1/min: 450

Del. quantity cm3/

1000s.: 9.00...15.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1160 Speed

Del. quantity cm3/

1000s.: 34.00...71.00

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 100 Del. quantity cm3/: 70.00...120.00 mind 1000s.: 70.00

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd spēēd

1/min: 1100 mm: 3.10...3.90 TD travel

mm: (2.80...4.20)

Shutoff	- Del. quantity cm3/: 34.0071.00
electromagnet Volt: 12	- 1000s.: -
3rd speed 1/min: 900	- 9th speed 1/min: 1100
TD travel mm: 2.302.70	- Shutoff
mm: (1.803.20)	- electromagnet Volt: 12
Shutoff	- Del. quantity cm3/: 65.5068.50
electromagnet Volt: 12	- 1000s.: (64.0070.00)
4th speed 1/min: 750	- 11th speed 1/min: 750
TD travel mm: 1.302.10	- Shutoff
mm: (1.002.40)	<ul><li>electromagnet Volt: 12</li><li>Del. quantity cm3/: 70.0074.00</li></ul>
Shutoff = lectromagnet Volt: 12 +	- Det. quantity (1137: 70:00:74:00 - 1000S.: (68.0076.00)
Telectronagnet vott. 12	- 12th speed 1/min: 900
Supply-pump pressure characteristic:	- Shutoff
supply pump pressure characteristic.	electromagnet Volt: 12
1st speed 1/min: 500	- Del. quyntity cm3/: 68.0069.00
Supply-pump +	- 1000s.: (65.5071.50)
pressure bar: 2.302.90	- 20th speed 1/min: 500
Shutoff	- Shutoff
electromagnet Volt: 12	- electromagnet Volt: 12
2nd speed 1/min: 900	- Del. quantity cm3/: 70.0078.00
Supply-pump +	- 1000s.: (68.0080.00)
pressure bar: 4.104.70	•
Shutoff	Mech. shutoff:
electromagnet Volt: 12	Mech. Abstellung:
3rd speed 1/min: 1100 +	- 4 1 - 4 1 4400
Supply-pump + CO F FO	1st speed 1/min: 1100
pressure bar: 4.905.50	Del. quantity cm3/: 0.003.00
Shutoff	1000s.: (0.003.00)
electromagnet Volt: 12	<ul><li>Shutoff</li><li>electromagnet volt: 12</li></ul>
Overlow quantity at overflow valve:	etectromagnet vott. 12
over tow qualitate at over flow valve.	Electr. shutoff:
1st speed 1/min: 500	-
Shutoff	1st speed 1/min: 450
electromagnet Volt: 12	Del. quantity cm3/: 0.003.00
Overflow : 41.7083.40 +	· 1000s.: (0.003.00)
quantity cm3/10s: (26.7098.40)	- Shutoff
2nd speed 1/min: 1100 +	electromagnet volt: -
Shutoff	
electromagnet Volt: 12	Idle delivery:
Overflow : 55.60139.00 +	4-1 4 / 150
quantity cm3/10s: (40.60154.00)	1st speed 1/min: 450
Dalinami analimati and haratania	Shutoff
Delivery-quant. and breakaway char.:	electromagnet Volt: 12 Del. quantity cm3/: 9.0015.00
I	1000s.: (7.0017.00)
2nd speed 1/min: 1230	Dispersion cm3/: 5.5
Shutoff +	1000s.: (7.0)
electromagnet Volt: 12	2nd speed 1/min: 530
Del. quantity cm3/: 0.003.00	Shutoff
1000s.: (0.003.00)	electromagnet Volt: 12
3rd speed 1/min: 1175	Del. quantity cm3/: 0.003.00
Shutoff	1000s.: (0.003.00)
electromagnet Volt: 12	
Del. quantity cm3/: 32.5037,50	Automatic starting fuel delivery:
1000\$.: (30.0040.00)	
5th speed 1/min: 1160 +	1st speed 1/min: 130
Shutoff	Shutoff
electromagnet Volt: 12	electromagnet Volt: 12

Del. quantity cm3/: 80.00...120.00 1000s.: (80.00...120.00)

2nd speed Shutoff 1/min: 240

electromagnet Volt: 12 Del. quantity cm3/: 40.00...80.00 1000s.: (40.00...80.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 70.00...120.00 10005.: (70.00...120.00)

## Shutoff electromagnet:

Cut-in

min voltage : 10.0 Rated voltage : 12.0

## Mounting and assembly dimensions:

Designation

K mm: -

mm: 5,0...5,4 mm: 1,1...1,5 mm: 3,5 KF MS

SVS max.

#### Remarks:

Overflow restriction 0.55 mm - Part No. ..303

Note inst. in remarks column

: CUM 3,9 N26 Test scheet : 12.07.91 Edition

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R378-4

Type number : 0 460 424 062 Customer Part-No. : 3 917 555

Customer-specific information

Customer

: CDC

Engine

: 4 BT 3.9 IND.

KW: 68 Power 1/min: 2200 Speed

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

bar: 250.00...253.00 Pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00

x Length

mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1,8

mm: +0,02(0,06)

Outlet

Injection pump setting values Test specifications in parentheses Timing-device travel

1/min: 900 Speed

Setting value mm: 2.30...2.70

Shutoff

electromagnet Volt: 24

Supply-pump pressure

1/min: 900 Speed

Setting value bar: 4.10...4.70

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

1/min: 900 Speed

Del. quantity cm3/

1000s.: 68.00...69.00

Shutoff

electromagnet Volt: 24 Dispersion cm3/: 4.0 1000s.: (4.5)

Low-idle speed regulation

Speed 1/min: 450

Del. quantity cm3/

1000s.: 9.00...15.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1160 Speed

Del. quantity cm3/

1000s.: 34.00...71.00

Shutoff

electromagnet Volt: 24

Start:

Speed 1/min: 100 Del. quantity cm3/: 70.00...120.00 mind 1000s.: 70.00

Shutoff

electromagnet Volt: 24

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed

1/min: 1100 mm: 3.10...3.90 TD travel

mm: (2.80...4.20)

Shutoff		+	Del. quantity cm3/:	34.0071.00
electromagnet Volt:	24	+	1000s.:	
3rd speed 1/min: TD travel mm:	900 2.302.70	†	9th speed 1/min: Shutoff	7700
	(1.803.20)	I	electromagnet Volt:	24
Shutoff	(1.00.1.0120)	+	Del. quantity cm3/:	65.5068.50
electromagnet Volt:	24	+	1000S.:	(64.00/U.00)
4th speed 1/min:	750	+	11th speed 1/min:	750
	1.302.10 (1.002.40)	1	Shutoff electromagnet Volt:	2/.
Shutoff	(1.002.40)	Ţ	Del. quantity cm3/:	70.0074.00
electromagnet Volt:	24	+	1000s.:	(68.0076.00)
		+	12th speed 1/min:	900
Supply-pump pressure	e characteristic:	†	Shutoff	2/.
1st speed 1/min:	500	I	<pre>electromagnet Volt: Del. quyntity cm3/:</pre>	48 00 49 00
Supply-pump	300	1	1000s.:	(65.5071.50)
pressure bar:	2.302.90	+	20th speed 1/min:	
Shutoff		+	Shutoff	24
electromagnet Volt:	24	†	electromagnet Volt:	24
2nd speed 1/min: Supply-pump	900	I	Del. quantity cm3/:	(68.0080.00)
pressure bar:	4.104.70	1	10000	(00.0000.00)
Shutoff		+	Mech. shutoff:	
electromagnet Volt:		+	Mech. Abstellung:	
3rd speed 1/min:	1100	†	1st speed 1/min:	1100
Supply-pump pressure bar:	4.905.50	I	Del. quantity cm3/:	0 00 3 00
Shutoff	4.705.50	1	10005.:	(0.003.00)
electromagnet Volt:	24	+	Shutoff	
A 1		+	electromagnet volt:	24
Overlow quantity at	overtiow valve:	1	Electr. shutoff:	
1st speed 1/min:	500	Ţ	Etecti. Silatori.	
Shutoff		+	1st speed 1/min:	450
electromagnet Volt:	24	+	Del. quantity cm3/:	0.003.00
Overflow : quantity cm3/10s:	41.7083.40	†	1000S.: Shutoff	(0.003.00)
2nd speed 1/min:		I	electromagnet volt:	_
Shutoff	1100	1	cecti onagilee voce.	
electromagnet Volt:	24	+	Idle delivery:	
Overflow :	55.60139.00	+	4	750
quantity cm3/10s:	(40.60154.00)	<b>†</b>	1st speed 1/min: Shutoff	450
Delivery-quant. and	breakaway char.:	Į	electromagnet Volt:	24
section y quantos untu		+	Del. quantity cm3/:	
	4070	+	1000s.:	(7.0017.00)
2nd speed 1/min:	1230	+	Dispersion cm3/:	5.5
Shutoff electromagnet Volt:	24	Î	2nd speed 1/min:	
Del. quantity cm3/:		1	Shutoff	<b>750</b>
1000s.:	(0.003.00)	+	electromagnet Volt:	24
3rd speed 1/min:	1175	+	Del. quantity cm3/:	0.003.00
Shutoff	2/.	†	1000S.:	(0.003.00)
electromagnet Volt: Del. quantity cm3/:	32.5037.50	I	Automatic starting 1	fuel delivery:
	(30.0040.00)	+	hatomatic starting i	acc accivery.
5th speed 1/min:		+	1st speed 1/min:	130
Shutoff	24	+	Shutoff	2/
electromagnet Volt:	<b>24</b>	+	electromagnet Volt:	<b>24</b>

Del. quantity cm3/: 80.00...120.00 1000s.: (80.00...120.00) 1/min: 240 2nd speed Shutoff electromagnet Volt: 24 Del. quantity cm3/: 40.00...80.00 1000s.: (40.00...80.00) 1/min: 100 4th speed Shutoff electromagnet Volt: 24 Del. quantity cm3/: 70.00...120.00 1000s.: (70.00...120.00) Shutoff electromagnet: Cut-in min voltage Rated voltage : 20.0 : 24.0 Mounting and assembly dimensions: Designation mm: mm: 5,0...5,4 mm: 1,1...1,5 mm: 3,5 KF MS SVS max. Remarks: Overflow restriction 0.55 mm - Part No. ..303

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : CUM 3,9 P4 : 16.07.91 : 28.03.90 Test scheet Edition replaces Calibrating oil : ISO-4113 : VE4/12F1150R374-1 Injection pump : 0 460 424 063 Type number Customer Part-No. : Customer-specific information : CDC Customer : 4 BTA 3.9 IND. Engine KW: 82 1/min: 2300 Power Speed TEST BENCH REQUIREMENTS Overflow restricti: 1 463 456 303 Calibrating—oil with thermometer : 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar : 0.30...0.40 Calibrating nozzle-holder : 1 688 901 027 assembly Opening bar: 250.00...253.00 Pressure Perforated plate mm: 0.5 diameter Test ini. tubing : 1 680 750 017 Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length Start of delivery Prestroke mm: 0,3 (from BDC): +0,02(0,04) Start of delivery block mm: 1,55 Piston stroke mm: +-0.02(0.06)**Outlet** 

Timing-device travel Speed 1/min: 850 Charge press. hPa: 1000 Setting value mm: 4.00...4.40 Shutoff electromagnet Volt: 12 Supply-pump pressure 1/min: 850 Speed Charge press hPa: 1000 Setting value bar: 5.60...6.20 Shutoff electromagnet Volt: 12 Full-load del. with charge press.: 1/min: 850 Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 85.50...86.50 Shutoff electromagnet Volt: 12 Dispersion cm3/: 4.0 1000s.: (4.5) Full-load del. w/out charge press.: 1/min: 500 Speed Del. quantity cm3/ 1000s.: 63.50...64.50 Shutoff electromagnet Volt: 12 Low-idle speed regulation 1/min: 375 Del. quantity cm3/ 1000s.: 8.00...14.00 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0) Full-load speed regulation Speed 1/min: 1220 Charge press hPa: 1000 Del. quantity cm3/ 1000s.: 62.50...68.50 Shutoff electromagnet Volt: 12 Start: 1/min: 100 Speed

Test specifications in parentheses

H03

Injection-pump setting values

Del. quantity cm3/: 60.00...130.00 mind 1000s.: 60.00 Shutoff electromagnet Volt: 12 : 55.60...139.00 Shutoff quantity cm3/10s: (40.60...154.00) electromagnet Volt: 12 Inspection-pump test specifications Delivery-quant. and breakaway char.: Test specifications in parentheses Timing-device characteristic: 1/min: 700\* 1nd speed Charge-air pressure-setting point hPa: 350 2nd speed 1/min: 1150 Charge press hPa: 1000 TD travel mm: 5.20...6.00 mm: (4.90...6.30) Shutoff electromagnet Volt: 12 Del. quantity cm3/: 79.50...80.50 Shutoff 1000s.: (76.00...84.00) 1/min: 1320 electromagnet Volt: 12 3rd speed 1/min: 850 2nd speed Charge press. hPa: 1000 Shutoff Charge press hPa: 1000 electromagnet Volt: 12
Del. quantity cm3/: 0.00...3.00
1000S.: (0.00...3.00)
3rd speed 1/min: 1260
Charge press. hPa: 1000
Shutoff TD travel mm: 4.00...4.40 mm: (3.50...4.90) Shutoff electromagnet Volt: 12
4th speed 1/min: 500
Charge press hPa: 1000
TD travel mm: 1.80...2.60 electromagnet Volt: 12
Del. quantity cm3/: 15.00...55.00
1000S.: (15.00...55.00) mm: (1.50...2.90) Shutoff 5th speed 1/min: 1220 Charge press. hPa: 1000 electromagnet Volt: 12 Shutoff Supply-pump pressure characteristic: electromagnet Volt: 12
Del. quantity cm3/: 62.50...68.50
1000S.: (59.50...71.50)
9th speed 1/min: 1150
Charge press. hPa: 1000
Shutoff 1/min: 500 1st speed Charge press. hPa: 1000 Supply-pump bar: 4.00...4.60 pressure Shutoff electromagnet Volt: 12 Del. quantity cm3/: 76.00...79.00 1000s.: (74.50...80.50) electromagnet Volt: 12 2nd speed 1/min: 850 Charge press. hPa: 1000 Supply-pump 1/min: 1000 10th speed Charge press. hPa: 1000 Shutoff bar: 5.60...6.20 pressure Shutoff electromagnet Volt: 12
Del. quantity cm3/: 79.50...82.50
1000S.: (77.50...84.50)
12th speed 1/min: 850
Charge press. hPa: 1000
Shutoff electromagnet Volt: 12 3rd speed 1/min: 1150 Charge press. hPa: 1000 Supply-pump bar: 6.90...7.50 pressure Shutoff electromagnet Volt: 12
Del. quyntity cm3/: 85.50...86.50
1000S.: (83.00...89.00) electromagnet Volt: 12 Overlow quantity at overflow valve: 1/min: 500 18th speed Charge press. hPa: -Shutoff 1st speed 1/min: 500 Charge press. hPa: electromagnet Volt: 12 Del. quantity cm3/: 63.50...64.50 1000s.: (60.00...68.00) Shutoff electromagnet Volt: 12 : 41.70...83.40 cm3/10s: (26.70...98.40) 1/min: 1150 Overflow quantity 2nd speed Mech. shutoff: Mech. Abstellung: Charge press. hPa: 1000

1/min: 1150 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Electr. shutoff: 1st speed 1/min: 375
Del. quantity cm3/: 0.00...3.00
1000s.: (0.00...3.00) KSB/AFB valve Volt: -Idle delivery: 1/min: 375 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 8.00...14.00 1000s.: (6.00...16.00) cm3/: 5.5Dispersion 1000S.: (7.0) 1/min: 450 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) Automatic starting fuel delivery: 1st speed 1/min: 130 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...130.00 1000s.: (60.00...130.00) 1/min: 230 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 20.00...60.00 1000s.: (20.00...60.00) 1/min: 100 4th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...130.00 1000s.: (60.00...130.00) Shutoff electromagnet: Cut-in min voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

mm: -

Designation

K

H05

KF mm: 5,0...5,4 MS mm: 1,0...1,4 SVS max. mm: 2,6

Remarks:

: C.D.C. # 391 7519 Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

Overflow restriction 0.55 mm - Part No. ..303

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : CUM 3,9 N31 Test scheet Edition : 15.07.91 : 18.01.90 replaces Calibrating oil : ISO-4113 Injection pump : VE4/12F1050R389 : 0 460 424 065 Type number Customer Part-No. : Customer-specific information Customer Engine : 4 BT- 390 AUTOM. Power KW: 81 1/min: 2100 Speed TEST BENCH REQUIREMENTS Calibrating-oil return temp. with thermometer : 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar: 0.30...0.40 Calibrating nozzle-holder : 1 688 901 027 assembly Opening | Pressure bar: 250.00...253.00 Perforated plate diameter mm: 0.5 Test inj. tubing : 1 680 750 017 Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840 Start of delivery Prestroke mm: 0.3(from BDC): +-0.02(0.04)Start of delivery block Piston stroke mm: 1.55 mm: +-0.02(0.06)

Timing-device travel 1/min: 750 Speed Charge press. hPa: 1000 Setting value mm: 3.40...3.80 Shutoff electromagnet Volt: 12 Supply-pump pressure Speed 1/min: 750 Charge press hPa: 1000 Setting value bar: 5,0...5,6 Shutoff electromagnet Volt: 12 Full-load del. with charge press.: Speed 1/min: 750 Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 89.50...90.50 Shutoff electromagnet Volt: 12 Dispersion cm3/: 4.0 1000s.: (4.5) Full-load del. w/out charge press.: 1/min: 500 Del. quantity cm3/ 1000s.: 63.50...64.50 Shutoff electromagnet Volt: 12 Low-idle speed regulation Speed 1/min: 375 Del. quantity cm3/ 1000s.: 8.00...14.00 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0) Full-load speed regulation 1/min: 1100 Speed Charge press hPa: 1000 Del. quantity cm3/ 1000s.: 59.00...65.00 Shutoff electromagnet Volt: 12 Start: Speed 1/min: 100 Del. quantity cm3/: 60.00...140.00 mind 1000s.: 60.00

Outlet

Injection-pump setting values
Test specifications in parentheses

Shutoff electromagnet Volt: 12	+ Overflow : 55.60139.00 quantity cm3/10s: (40.60154.00)
Inspection-pump test specifications Test specifications in parentheses	Delivery-quant. and breakaway char.:
Timing-device characteristic:	1nd speed 1/min: 700*
2nd speed 1/min: 1050 Charge press hPa: 1000 TD travel mm: 4.705.50	<ul> <li>Charge-air pressure-setting</li> <li>point hPa: 350</li> <li>Shutoff</li> <li>electromagnet Volt: 12</li> </ul>
mm: (4.405.80) Shutoff electromagnet Volt: 12	+ Del. quantity cm3/: 79.5080.50 + 1000s.: (76.0084.00) + 2nd speed 1/min: 1180
3rd speed 1/min: 750 Charge press hPa: 1000 TD travel mm: 3.403.80	<ul><li>Charge press. hPa: 1000</li><li>Shutoff</li><li>electromagnet Volt: 12</li></ul>
mm: (2.904.30) Shutoff electromagnet Volt: 12	Del. quantity cm3/: 0.003.00 1000s.: (0.003.00) 5th speed 1/min: 1100
4th speed 1/min: 500 Charge press hPa: 1000 TD travel mm: 1.702.50	+ Charge press. hPa: 1000 + Shutoff + electromagnet Volt: 12
mm: (1.402.80) Shutoff electromagnet Volt: 12	+ Del. quantity cm3/: 59.0065.00 + 1000s.: (56.0068.00) + 6th speed 1/min: 1120
Supply—pump pressure characteristic:	+ Charge press. hPa: 1000 + Shutoff
1st speed 1/min: 500 Charge press. hPa: 1000 Supply-pump	+ electromagnet Volt: 12 + Del. quantity cm3/: 15.0055.00 + 1000s.: (15.0055.00) + 9th speed 1/min: 1050
pressure bar: 3.904.50 Shutoff electromagnet Volt: 12	+ Charge press. hPa: 1000 + Shutoff + electromagnet Volt: 12
3rd speed 1/min: 750 Charge press. hPa: 1000 Supply-pump	Del. quantity cm3/: 76.5079.50 1000s.: (75.0081.00) 12th speed 1/min: 750
pressure bar: 5.005.60 Shutoff	+ Charge press. hPa: 1000 + Shutoff + electromagnet Volt: 12
electromagnet Volt: 12 4th speed   1/min: 1050 Charge press. hPa: 1000 Supply-pump	Del. quyntity cm3/: 89.5090.50 1000s.: (87.0093.00) 18th speed 1/min: 500
pressure bar: 6.306.90 Shutoff	+ Charge press. hPa: - + Shutoff
<pre>electromagnet Volt: 12 Overlow quantity at overflow valve:</pre>	+ electromagnet Volt: 12 + Del. quantity cm3/: 63.5064.50 + 10008.: (60.0068.00)
1st speed 1/min: 500 Charge press. hPa: -	<pre>Mech. shutoff:     Mech. Abstellung:</pre>
Shutoff electromagnet Volt: 12 Overflow : 41.7083.40 quantity cm3/10s: (26.7098.40) 2nd speed 1/min: 1050 Charge press. hPa: 1000 Shutoff electromagnet Volt: 12	1st speed 1/min: 1050 Charge press. hPa: 1000 Del. quantity cm3/: 0.003.00 1000s.: (0.003.00) Shutoff electromagnet volt: 12

Electr. shutoff: 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1/min: 375 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 8.00...14.00 1000s.: (6.00...16.00) cm3/: 5.5 1000s.: (7.0) Dispersion 1/min: 450 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) Automatic starting fuel delivery: 1st speed 1/min: 130 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...140.00 1000s.: (60.00...140.00) 1/min: 230 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 20.00...60.00 1000s.: (20.00...60.00) 4th speed 1/min: 100 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...140.00 1000s.: (60.00...140.00) Shutoff electromagnet: Cut-in min voltage : 10.0 : 12.0 Rated voltage Mounting and assembly dimensions: Designation Κ mm: -KF mm: 5,0...5,4mm: 1,0...1,4MS mm: 2,2 SVS max. Remarks:

: C.D.C. # 391 7516

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: CAS 3,9 M : 15.07.91 Test scheet Edition

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R391 Type number : 0 460 424 068

Customer Part-No. :

Customer-specific information

Customer : CASE

: 4 TA 390 /66KW Engine

KW: 66 Power 1/min: 2200 Speed

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250.00...253.00 Pressure

Perforated plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): 0,02(0,04)

Start of delivery block mm: 1,55 Piston stroke

mm: +0.02(0.06)

Outlet | : A

Injection-pump setting values

Test specifications in parentheses

Timing-device travel

1/min: 750 Speed

Charge press. hPa: 1000 Setting value mm: 3.30...3.70

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 750 Speed Charge press hPa: 1000

Setting value bar: 4.50...5.10

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 750 Charge press. hPa: 1000

Del. quantity cm3/

1000s.: 83.50...84.50

Shutoff

electromagnet Volt: 12 cm3/: 4.0 Dispersion 1000s.: (4.5)

Full-load del. w/out charge press.:

1/min: 500 Speed

Del. quantity cm3/

1000s.: 63.00...64.00

Shutoff

electromagnet Volt: 12

Low-idle speed regulation

1/min: 450 Speed

Del. quantity cm3/

1000s.: 8.50...14.50

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

Speed 1/min: 1170 Charge press hPa: 1000

Del. quantity cm3/

1000s.: 36.50...42.50

Shutoff

electromagnet Volt: 12

Start:

1/min: 100 Speed

Del. quantity cm3/: mind 1000s.:	50.00100.00 50.00	<b>†</b>	Shutoff electromagnet Volt:	12
Shutoff	30.00	1	Overflow :	55.60139.00
electromagnet Volt:	12	±	quantity cm3/10s:	(40.60154.00)
Inspection-pump tes	t specifications	Ŧ	Delivery-quant. and	breakaway char.
Test specifications	in parentheses	<u>†</u>		
Timing-device chara	cteristic:	Ī	1nd speed 1/min: Charge—air pressure	
2nd speed 1/min:		+	point hPa:	325
Charge press hPa:	1000	+	Shutoff	
	4.505.30	+	electromagnet Volt:	12
Shutoff	(4.205.60)	İ	Del. quantity cm3/:	77.5078.50 (74.0082.00)
	12	T	2nd speed 1/min:	
electromagnet Volt:		T		
3rd speed 1/min:		T	Charge press. hPa:	1000
Charge press hPa:	1000	T	Shutoff	13
TD travel mm:	3.303.70	+	electromagnet Volt:	16
	(2.804.20)	†	Del. quantity cm3/:	0.003.00
Shutoff	40	+		(0.003.00)
electromagnet Volt:	12	+	3rd speed 1/min:	
4th speed 1/min:		+	Charge press. hPa:	1000
Charge press hPa:	1000	+	Shutoff	
	1.602.40	+	electromagnet Volt:	12
mm:	(1.302.70)	+	Del. quantity cm3/:	15.0045.00
Shutoff		+	1000s.:	(15.0045.00)
electromagnet Volt:	12	+	5th speed 1/min:	1170
5		+	Charge press. hPa:	
Supply-pump pressur	e characteristic:	1	Shutoff	
		+	electromagnet Volt:	12
1st speed 1/min:	500	1	Del. quantity cm3/:	36.5042.50
	1000	1	Del. quantity cm3/: 1000s.:	(33.50 .45.50)
Supply-pump	1000	1	9th speed 1/min:	1100
pressure bar:	3.404.00	1	Charge press. hPa:	
Shutoff	3.404.00	1	Shutoff	1000
	12	Τ		12
electromagnet Volt:	750	T	electromagnet Volt:	47 00 70 00
2nd speed 1/min:		T	Del. quantity cm3/:	(65.5071.50)
	1000	<b>T</b>		
Supply-pump	/ 50 5 40	†	10th speed 1/min:	900 4000
pressure bar:	4.505.10	†	Charge press. hPa:	1000
Shutoff	40	†	Shutoff	40
electromagnet Volt:		+	electromagnet Volt:	12
3rd speed 1/min:		+	Del. quantity cm3/:	(3.50(7.50
Charge press. hPa:	1000	+	1000s.: 12th speed 1/min:	(72.5079.00)
Supply-pump		+	12th speed 1/min:	750_
	5.906.50	+	Charge press. hPa:	10:00
Shutoff		+	Shutoff	
electromagnet Volt:	12	+	electromagnet Volt:	12
		+	Del. quyntity cm3/:	83.5084.50
Overlow quantity at	overflow valve:	+	1000s.:	(81.0087.00)
, .		+	18th speed 1/min:	500
1st speed 1/min:	500	+	Charge press. hPa:	
Charge press. hPa:		+	Shutoff	
Shutoff		1	electromagnet Volt:	12
electromagnet Volt:	12	1	Del. quantity cm3/:	63 00 64 00
	41.7083.40	1	1000	(60.0067.00)
quantity cm3/10s:	(26.7098.40)	1	20th speed 1/min:	
2nd speed 1/min:	1100	Ι	Charge press. hPa:	
Charge proce hose	1000	Ι	charge press. IIFa.	1000
Charge press. hPa:	1000	T		

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 84.00...92.00 1000S.: (82.00...94.00)

Mech. shutoff:

Electr. shutoff:

1/min: 450 1st speed

Del. quantity cm3/: 0.00...3.00

1000s.: (0.00...3.00)

Shutoff

electromagnet volt: 12

Idle delivery:

1st speed 1/min: 450

Shutoff

1000s.: (7.0)

1/min: 600 2nd speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00

1000s.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 250

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 75.00...135.00 1000s.: (75.00...135.00)

1/min: 450 2nd speed

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 45.00...75.00 1000s.: (45.00...75.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 50.00...100.00 1000s.: (50.00...100.00)

Shutoff electromagnet:

Cut-in

min voltage

: 12.0 Rated voltage

Mounting and assembly dimensions:

Designation

mm: -

H11

mm: 5,0...5,4 mm: 0,8...1,2 mm: 1,3 KF MS

SVS max.

Remarks:

Operate control lever after each 26 manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No. ..303

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column Test scheet : CAS 3,9 M1 : 15.07.91 Edition replaces Calibrating oil : ISO-4113 Injection pump : VE4/12F1100R391-1 : 0 460 424 072 Type number Customer Part-No. : Customer-specific information Customer : CASE : 4BT-3.9 Engine TEST BENCH REQUIREMENTS Calibrating-oil return temp. with thermometer : 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar : 0.30...0.40 Calibrating nozzle-holder : 1 688 901 027 assembly Openina bar: 250.00...253.00 Pressure Perforated plate diameter mm: 0.5 Test inj. tubing : 1 680 750 017 Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840 Start of delivery Prestroke mm: 0.3(from BDC): +0.02(0.04)

1/min: 750 Speed Charge press. hPa: 1000 Setting value mm: 2.10...2.50 electromagnet Volt: 12 Supply-pump pressure Speed 1/min: 750 Charge press hPa: 1000 Setting value bar: 4.20...4.80 Shutoff electromagnet Volt: 12 Full-load del. with charge press.: Speed 1/min: 750 Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 72.00...73.00 Shutoff electromagnet Volt: 12 Dispersion cm3/: 4.0 1000s.: (4.5) Full-load del. w/out charge press.: 1/min: 500 Speed Del. quantity cm3/ 1000s.: 45.50...46.50 Shutoff electromagnet Volt: 12 Low-idle speed regulation 1/min: 400 Speed Del quantity cm3/ 1000s.: 8.50...14.50 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0) Full-load speed regulation 1/min: 1170 Speed Charge press hPa: 1000 Del. quantity cm3/ 1000s.: 47.00...53.00 Shutoff electromagnet Volt: 12 Start: 1/min: 100 Speed Del. quantity cm3/: 60.00...120.00 mind 1000s.: 60.00 Shutoff electromagnet Volt: 12

Outlet

Start of delivery block

Piston stroke mm: 1,8

Timing-device travel

Injection-pump setting values Test specifications in parentheses

mm: +0.02(0.06)

Inspection-pump test specifications Test specifications in parentheses Delivery-quant. and breakaway char.: 1/min: 700\* Timing-device characteristic: 1nd speed Charge-air pressure-setting point hPa: 325 1/min: 900 2nd speed hPa: 1000 mm: 2.80...3.60 mm: (2.50...3.90) Shutoff Charge press electromagnet Volt: 12 Del. quantity cm3/: 68.50...69.50 1000s.: (65.00...73.00) TD travel Shutoff 2nd speed 1/min: 1280 Charge press. hPa: 1000 electromagnet Volt: 12 3rd speed 1/min: 750 Charge press hPa: 1000 Shutoff electromagnet Volt: 12
Del. quantity cm3/: 0.00...3.00
1000s.: (0.00...3.00)
Del. quantity cm3/: 0.00...15.00
1000s.: (0.00...15.00)
4th speed 1/min: 1180 TD travel mm: 2.10...2.50 mm: (1.60...3.00) Shutoff electromagnet Volt: 12 4th speed 1/min: 600 Charge press hPa: 1000 TD travel Charge press. hPa: 1000 mm: 0.80...1.60 Shutoff mm: (0.50...1.90) electromagnet Volt: 12
Del. quantity cm3/: 15.00...55.00
1000S.: (15.00...55.00)
5th speed 1/min: 1170
Charge press. hPa: 1000
Shutoff Shutoff electromagnet Volt: 12 Supply-pump pressure characteristic: 1st speed 1/min: 500 Charge press. hPa: 1000 electromagnet Volt: 12 Del. quantity cm3/: 47.00...53.00 1000s.: (44.00...56.00) Supply-pump pressure bar: 3.10...3.70 1/min: 1100 Shutoff 9th speed Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 2nd speed 1/min: 750 Charge press. hPa: 1000 electromagnet Volt: 12 Del. quantity cm3/: 62.00...65.00 1000s.: (60.50...66.50) 10th speed 1/min: 900 Supply-pump pressure bar: 4.20...4.80 Shutoff Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1100 Charge press. hPa: 1000 Supply-pump electromagnet Volt: 12 Del. quantity cm3/: 63.50...68.50 1000s.: (62.00...70.00) 12th speed 1/min: 750 pressure bar: 5.80...6.40 Shutoff Charge press. hPa: 1000 Shutoff electromagnet Volt: 12 Overlow quantity at overflow valve: 1st speed 1/min: 500 Charge press. hPa: -Shutoff Charge press. hPa: -Shutoff electromagnet Volt: 12 : 41.70...83.40 electromagnet Volt: 12 Del. quantity cm3/: 45.50...46.50 1000S.: (42.00...50.00) Overflow cm3/10s: (26.70...98.40) quantity 2nd speed 1/min: 1100 Charge press. hPa: 1000 Shutoff Mech. shutoff: electromagnet Volt: 12 Overflow : 55.60...139.00 Mech. Abstellung: cm3/10s: (40.60...154.00) 1st speed 1/min: 1100 quantity

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Electr. shutoff: 1st speed 1/min: 400 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1st speed 1/min: 400 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 8.50...14.50 1000s.: (6.50...16.50) cm3/: 5.5 Dispersion 1000s.: (7.0) 1/min: 550 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) Automatic starting fuel delivery: 1/min: 250 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 55.00...115.00 1000s.: (55.00...115.00) 2nd speed 1/min: 400 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 15.00...65.00 1000s.: (15.00...65.00) 1/min: 100 4th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 60.00...120.00 1000s.: (60.00...120.00) Shutoff electromagnet: Cut-in min voltage : 10.0 : 12.0 Rated voltage Mounting and assembly dimensions: Designation K mm: -

> mm: 5,0...5,4 mm: 1,2...1,6

KF

MS

H14

SVS max. mm: 2,5

Remarks:

: CASE # 391 7014 Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: CUM 3,9 P43 Test scheet Edition : 15.07.91

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R378-7 Type number : 0 460 424 074

Customer Part-No.:

Customer-specific information

Customer

: 4 BT-390 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250.00...253.00 Pressure

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

mm: 0,3 Prestroke

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke

mm: 2,35 mm: +-0,02(0,06)

Outlet : D

Injection pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 900 Setting value mm: 2.30...2.70

Shutoff

electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 900

Setting value bar: 4.10...4.70

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 750 Speed

Del. quantity cm3/

1000s.: 63.50...64.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4.0 1000s.: (4.5)

Low-idle speed regulation

1/min: 475

Del. quantity cm3/

1000s.: 6.00...12.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1160 Speed

Del. quantity cm3/

1000s.: 31.50...38.50

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 100 Del. quantity cm3/: 70.00...120.00

1000s.: 70.00

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1100 2nd speed

TD travel mm: 3.10...3.90 mm: (2.80...4.20)

Shutoff

electromagnet Volt: 12 3rd speed 3 1/min: 900

TD travel mm; 2.	.302.70	Shutoff
Shutoff	1.803.20)	electromagnet Volt: 12
electromagnet Volt: 12	· I	Del. quantity cm3/: 60.5063.50 1000s.: (59.0065.00)
4th speed 1/min: 65	iso I	10th speed 1/min: 900
TD travel mm: 0.	.701.50	Shutoff
	0.401.80)	electromagnet Volt: 12
Shutoff	1	Del. quantity cm3/: 60.8063.80
electromagnet Volt: 12	2 🗼	1000s.: (58.8065.80)
3	+	12th speed 1/min: 750
Supply-pump pressure c	characteristic:	Shutoff
4	+	electromagnet Volt: 12
1st speed 1/min: 50	JU +	Del. quyntity cm3/: 63.5064.50
Supply-pump	(0 7 00	1000s.: (61.0067.00)
pressure bar: 2. Shutoff	.403.00	20th speed
electromagnet Volt: 12	· I	electromagnet Volt: 12
2nd speed 1/min: 90	īo I	Del. quantity cm3/: 61.0069.00
Supply-pump	1	1000\$.: (59.0071.00)
pressure bar: 4.	.104.70	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Shutoff	+	Mech. shutoff:
electromagnet Volt: 12	? <del> </del>	Mech. Abstellung:
3rd speed 1/min: 11	100 +	
Supply-pump , ,	60 F 50 T	1st speed
	.905.50	Del. quantity cm3/: 0.003.00
Shutoff	, †	1000s.: (0.003.00) Shutoff
electromagnet Volt: 12	<del>-</del> I	electromagnet volt: 12
Overlow quantity at ov	verflow valve:	etecti dilagnet vott. 12
over con quarterey at ov	1	Electr. shutoff:
1st speed 1/min: 50	oo 1	
Shutoff	+	1st speed 1/min: 475
electromagnet Volt: 12	2 +	Del. quantity cm3/: 0.003.00
Overflow : 41	1.7083.40 +	1000s.: (0.003.00)
quantity cm3/10s: (2	26.7098.40)	Shutoff
2nd speed 1/min: 11 Shutoff	†	electromagnet volt: -
electromagnet Volt: 12	, I	Idle delivery:
Overflow : 55	5.60139.00 I	Tate decivery.
quantity cm3/10s: (4		1st speed 1/min: 475
444.70.70	1	Shutoff
Delivery-quant. and br	reakaway char.:	electromagnet Volt: 12
	+	Del. quantity cm3/: 6.0012.00
	+	1000 <u>s</u> .: (4.0014.00)
2nd speed 1/min: 12	250 +	Dispersion cm3/: 5.5
Shutoff	, †	1000s.: (7.0)
electromagnet Volt: 12 Del. quantity cm3/: 0.0		2nd speed 1/min: 550 Shutoff
1000s · (0	).003.00)	electromagnet Volt: 12
3rd speed 1/min: 11		Del. quantity cm3/: 0.004.00
Shutoff	1	1000\$.: (0.004.00)
electromagnet Volt: 12	· · · · · · · · · · · · · · · · · · ·	
Del. quantity cm3/: 10	).0040.00	Automatic starting fuel delivery:
1000s.: (1)	10.0040.00)	-
5th speed 1/min: 11	160 +	1st speed 1/min: 130
Shutoff	, †	Shutoff
electromagnet Volt: 12	50 30 50 T	electromagnet Volt: 12
Del. quantity cm3/: 31	29.0041.00)	Del. quantity cm3/: 70.00130.00 1000s.: (70.00130.00)
9th speed 1/min: 110		10003 (10.00130.00)

1/min: 240 2nd speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 30.00...70.00 1000s.: (30.00...70.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 70.00...120.00 1000s.: (70.00...120.00)

### Shutoff electromagnet:

Cut-in

min voltage : 10.0 : 12.0 Rated voltage

Mounting and assembly dimensions:

Designation

K mm: mm: K-OT mm: 1,2...1,6 mm: 3,2 KF MS SVS max.

Remarks:

: C.D.C. # 391 7528

Note inst. in remarks column

Test scheet : FIA 3,6 N Edition : 15.07.91

replaces

Calibrating oil : ISO-4113

: VE4/12F1350R407 Injection pump Type number : 0 460 424 075

Customer Part-No. :

Customer-specific information Customer : IVECO-FIAT

: 8040.25.4000 TC Engine

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil °C return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina

bar: 250.00...253.00 Pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 450 x Length

Start of delivery Prestroke mm: -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel

1/min: 1000 Speed Charge press. hPa: 1000

mm: 1.40...1.80 Setting value

Shutoff

electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1000

Charge press hPa: 1000 Setting value bar: 5.70...6.30

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 700 Charge press. hPa: 1000 Del. quantity cm3/ 1000S.: 78.50...79.50

Shutoff

electromagnet Volt: 24 Dispersion cm3/: 3.5 1000s.: (5.0)

Full-load del. w/out charge press.:

1/min: 600 Speed

Del. quantity cm3/ 1000s.: 50.50...51.50

Shutoff

electromagnet Volt: 24

Low-idle speed regulation

1/min: 250

Del. quantity cm3/

1000s.: 13.00...17.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 3.5 1000S.: (5.0)

Full-load speed regulation

Speed 1/min: 1525 Charge press hPa: 1000

Del. quantity cm3/

1000s.: 30.00...36.00

Shutoff

electromagnet Volt: 24

Start:

1/min: 100 Speed

Del. quantity cm3/: 60.00...110.00 mind 1000s.: 60.00

mind

Shutoff

electromagnet Volt: 24

Inspection-pump test specifications Test specifications in parentheses

Timing-device chara	cteristic:	+	Charge-air pressure	- <u>set</u> ting
2-1 4 /	1400	+	point hPa:	
2nd speed 1/min:		†		6,7
Charge press hPa:	1000	+	Shutoff	2/
TD travel mm:	2.203.00	†	electromagnet Volt:	24 40 00 70 00
	(1.703.50)	†	Del. quantity cm3/:	09.00(0.00
Shutoff	2/	†		(65.5073.50)
electromagnet Volt:	<u> </u>	†	2nd speed 1/min:	
3rd speed 1/min:	1000	+	Charge press. hPa:	1000
	1000	†	Shutoff	21
	1.401.80	+	electromagnet Volt:	24
	(0.702.50)	+	Del. quantity cm3/:	0.003.00
5th speed 1/min:	1350	+		(0.003.00)
Charge press. hPa:	7000	+	5th speed 1/min:	
	3.704.50	†	Charge press. hPa:	1000
	(3.205.00)	+	Shutoff	21
Shutoff	24	+	electromagnet Volt:	
electromagnet Volt:	24	+	Del. quantity cm3/:	30.0036.00
_		+		(27.0039.00)
Supply-pump pressure	e characteristic:	+	8th speed 1/min:	1475
		+	Charge press. hPa:	1000
1st speed 1/min:	600	+	Shutoff	
<b>,</b>	1000	+	electromagnet Volt:	24
Supply-pump .	/	+	Del. quantity cm3/:	43.0051.00
	3.704.30	+		(41.0053.00)
Shutoff	_,	+	9th speed 1/min:	
electromagnet Volt:	24	+	Charge press. hPa:	1000
2nd speed 1/min:	1000	+	Shutoff	<b></b>
	1000	+	electromagnet Volt:	24
Supply-pump .		+	Del. quantity cm3/:	
	5.706.30	+		(66.5073.50)
Shutoff		+	10th speed 1/min:	
electromagnet Volt:	24	+	Charge press. hPa:	1000
3rd speed 1/min:		+	Shutoff	
	1000	+	electromagnet Volt:	24
Supply-pump .	7 0 40	+	Del. quantity cm3/:	71.0075.00
· · · · · · · · · · · · · · · · · · ·	7.508.10	+		(69.5076.50)
Shutoff	-1	+	12th speed 1/min:	
electromagnet Volt:	24	+	Charge press. hPa:	1000
- I	<b>5</b> 1	+	Shutoff	<b>0</b> /
Overlow quantity at	overtiow valve:	+	electromagnet Volt:	24
	400	+	Del. quyntity cm3/:	79.0080.00
1st speed 1/min:		+		(76.0083.00)
Charge press. hPa:	1000	+	18th speed 1/min:	
Shutoff	0.4	+	Charge press. hPa:	-
electromagnet Volt:	24	+	Shutoff	21
	41.7083.40	+	electromagnet Volt:	24
quantity cm3/10s:	(26.7098.40)	+	Del. quantity cm3/:	51.5052.50
2nd speed 1/min:	1350	+		(48.5055.50)
Charge press. hPa:	1000	+	20th speed 1/min:	
Shutoff	24	+	Charge press. hPa:	1000
electromagnet Volt:		+	Shutoff	21
Overflow :	55.60139.00	+	electromagnet Volt:	
quantity cm3/10s:	(40.00154.00)	†	Del. quantity cm3/:	04.0000.00
Daller and Control 1	handler at the se	†	1000S.:	(81.0088.00)
Delivery-quant. and	preakaway char.:	†	21th speed 1/min:	JUU
		†	Charge press. hPa:	_
deal aread Adv.	<b>700</b> 3	†	Shutoff	2/
1nd speed 1/min:	OUU*	†	electromagnet Volt:	<b>C4</b>
		+		

Del. quantity cm3/: 50.00...54.00 1000s.: (48.00...56.00)

Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1350

Charge press. hPa: 1000 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Shutoff

electromagnet volt: 24

Electr. shutoff:

1st speed 1/min: 250

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Shutoff

electromagnet volt: -

Idle delivery:

1st speed 1/min: 250

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 13.00...17.00 1000s.: (10.00...20.00) Dispersion cm3/: 3.5

1000s.: (5.0) 1/min: 375 2nd speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 0.00...3.00

1000s.: (0.00...3.00)

Automatic starting fuel delivery:

1/min: 130 1st speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 60.00...110.00 1000s.: (60.00...110.00)

1/min: 230 2nd speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 45.00...65.00 1000s.: (45.00...65.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 60.00...110.00

1000s.: (60.00...110.00)

Shutoff electromagnet:

Cut-in

min voltage : 20.0

H20

Rated voltage : 24.0

Mounting and assembly dimensions:

Designation

K KF mm: 3,7 mm: K-OT mm: 0,7...1,1 MS LDA stroke mm: 6,7

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: FIA 3,6 N1 Test scheet : 15.07.91 Edition

replaces

Calibrating oil : ISO-4113

: VE4/12F1350R407-1 Injection pump Type number : 0 460 424 076

Customer Part-No. :

Customer—specific information : IVECO-FIAT Customer

: 8040.45.4000 TCA Engine

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250.00...253.00 Pressure

Perforated plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 450 x Length

Start of delivery Prestroke mm: -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timina-device travel

1/min: 1000 Charge press. hPa: 1000

Setting value mm: 1.90...2.30

Shutoff

electromagnet Volt: 24

Supply-pump pressure

1/min: 1000 Speed

Charge press hPa: 1000 Setting value bar: 5.80...6.40

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

1/min: 700 Speed Charge press. hPa: 1000

Del. quantity cm3/ 1000s.: 72.00...73.00

Shutoff

electromagnet Volt: 24 Dispersion cm3/: 3.5 1000s.: (5.0)

Full-load del. w/out charge press.:

1/min: 600

Del. quantity cm3/

1000s.: 42.50...43.50

Shutoff

electromagnet Volt: 24

Low-idle speed regulation

Speed 1/min: 250

Del. quantity cm3/

1000s.: 13.00...17.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 3.5 1000s.: (5.0)

Full-load speed regulation

1/min: 1525 hPa: 1000 Speed Charge press

Del. quantity cm3/ 1000s.: 23.00...29.00

Shutoff

electromagnet Volt: 24

Start:

Speed 1/min: 100 Del. quantity cm3/: 60.00...110.00 mind 1000s.: 60.00

Shutoff

electromagnet Volt: 24

Inspection-pump test specifications Test specifications in parentheses

Timing-device chara	cteristic:	<u>†</u>	1nd speed 1/min: Charge—air pressure	
2nd speed 1/min: Charge press hPa: TD travel mm:	1100 1000 2.203.00	+	point hPa: LDA-stroke mm:	510 6,9
Shutoff	(1.703.50)	Ī	Shutoff electromagnet Volt: Del. quantity cm3/:	24 62 00 63 00
electromagnet Volt: 3rd speed 1/min:		†	1000s.: 2nd speed 1/min:	(58.5066.50)
Charge press hPa: TD travel mm:	1000 1.40 <b>1</b> .80	‡	Charge press. hPa: Shutoff	1000
Shutoff	(0.702.50)	‡	electromagnet Volt: Del. quantity cm3/:	0.003.00
electromagnet Volt: 5th speed 1/min: Charge press. hPa:		Ī	5th speed 1/min: Charge press. hPa:	(0.003.00) 1525 1000
TD travel mm:	3.704.50 (3.205.00)	Ī	Shutoff electromagnet Volt:	
Shutoff electromagnet Volt:		+	Del. quantity cm3/: 1000s.:	30.0036.00 (27.0039.00)
Supply-pump pressur	e characteristic:	†	8th speed 1/min: Charge press. hPa: Shutoff	
	600 1000	‡	electromagnet Volt: Del. quantity cm3/:	49.0057.00
Supply-pump pressure bar: Shutoff	4.104.70	‡	9th speed 1/min: Charge press. hPa:	(47.0059.00) 1350 1000
electromagnet Volt: 2nd speed 1/min:	1000	+	Shutoff electromagnet Volt:	24
Supply-pump	1000	+		(61.0068.00)
pressure bar: Shutoff electromagnet Volt:	5.806.40	†	10th speed 1/min: Charge press. hPa: Shutoff	
3rd speed 1/min:		Ī	electromagnet Volt: Del. quantity cm3/:	24 64 · 50 · · · 68 · 50
Supply-pump pressure bar:	7.207.80	‡	1000s.: 12th speed 1/min:	(63.0070.00) 700
Shutoff electromagnet Volt:	24	+	Charge press. hPa: Shutoff	
Overlow quantity at	overflow valve:	‡	electromagnet Volt: Del. quyntity cm3/: 1000s.:	72.0073.00 (69.0076.00)
1st speed 1/min: Charge press. hPa: Shutoff		+	18th speed 1/min: Charge press. hPa:	600
electromagnet Volt:	24 104.25145.95	-	Shutoff electromagnet Volt: Del. quantity cm3/:	24 42,5043,50
quantity cm3/10s: 2nd speed 1/min:	(89,25160.95) 1350	‡	1000s.: 20th speed 1/min:	(39.5046.50) 600
Charge press. hPa: Shutoff		‡	Charge press. hPa: Shutoff	
electromagnet Volt: Overflow : quantity cm3/10s:	111.20194.60	‡ †		74.5078.50 (73.0080.00)
Delivery-quant. and	breakaway char.:	‡	21th speed 1/min: Charge press. hPa: Shutoff	
		+	electromagnet Volt:	24

Del. quantity cm3/: 41.00...45.00 1000s.: (39.00...47.00) Mech. shutoff: Mech. Abstellung: 1/min: 1350 1st speed

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Shutoff

electromagnet volt: 24

Electr. shutoff:

1/min: 250 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Shutoff

electromagnet volt: -

Idle delivery:

1/min: 250 1st speed Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 13.00...17.00

1000s.: (10.00...20.00)

Dispersion cm3/: 3.5

1000s.: (5.0)

1/min: 375 2nd speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 60.00...110.00 1000s.: (60.00...110.00)

1/min: 230

2nd speed Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 30.00...50.00 1000s.: (45.00...65.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 60.00...110.00 1000s.: (60.00...110.00)

Shutoff electromagnet:

Cut-in

min voltage Rated voltage Mounting and assembly dimensions:

Designation

mm: 3,7 K KF mm: K-OT mm: 0,7...1,1 MS mm: 6,9 LDA stroke

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No. ..303

H23

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : CUM 3,9 P35 Test scheet : 15.07.91 Edition replaces Calibrating oil : ISO-4113 Injection pump : VE4/12F1050R389-2 : 0 460 424 078 Type number Customer Part-No. : Customer-specific information Customer Engine : 4 BT- 390 AUTOM. Power KW: 78 1/min: 2100 Speed return temp. : 1 688 901 027 bar: 250.00...253.00 mm: 840 mm: 0,3 (from BDC): + 0.02(0.04)

TEST BENCH REQUIREMENTS Calibrating-oil with thermometer : 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar: 0.30...0.40 Calibrating nozzle-holder assembly Opening Pressure Perforated plate diameter mm: 0.5 Test inj. tubing : 1 680 750 017 Outside diameter : 6.00 x Wall thickness : 2.00 x Length Start of delivery Prestroke Start of delivery block mm: 1,55 Piston stroke mm: +-0.02(0.06)Outlet. Injection-pump setting values Test specifications in parentheses H24

Timing-device travel 1/min: 750 Charge press. hPa: 1000 Setting value mm: 3.40...3.80 Shutoff electromagnet Volt: 24 Supply-pump pressure Speed 1/min: 750 Charge press hPa: 1000 Setting value bar: 5.00...5.60 Shutoff electromagnet Volt: 24 Full-load del. with charge press.: 1/min: 750 Speed Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 89.50...90.50 Shutoff electromagnet Volt: 24 Dispersion cm3/: 4.0 1000s.: (4.5) Full-load del. w/out charge press.: Speed 1/min: 500 Del. quantity cm3/ 1000s.: 63.50...64.50 Shutoff electromagnet Volt: 24 Low-idle speed regulation 1/min: 375 Speed Del. quantity cm3/ 1000S.: 8.00...14.00 Shutoff electromagnet Volt: 24 Del. quantity cm3/: 5.5 1000s.: (7.0) Full-load speed regulation Speed 1/min: 1100 Charge press hPa: 1000 Del. quantity cm3/ 1000s.: 59.00...65.00 Shutoff electromagnet Volt: 24 Start: Speed 1/min: 100 Del. quantity cm3/: 60.00...140.00

1000s.: 60.00

Shutoff	+ Shutoff
electromagnet Volt: 24	+ electromagnet Volt: 24 + Overflow : 55.60139.00
Inspection-pump test specifications Test specifications in parentheses	+ quantity cm3/10s: (40.60154.00)
Timing-device characteristic:	<pre>Delivery-quant. and breakaway char.:</pre>
2nd speed 1/min: 1050	† + 1nd speed
Charge press hPa: 1000	Charge-air pressure-setting
TD travel mm: 4.705.50	point hPa: 350
mm: (4.405.80)	+ Shutoff
Shutoff electromagnet Volt: 24	electromagnet Volt: 24 Del. quantity cm3/: 79.5080.50
3rd speed 1/min: 750	1000s.: (76.0084.00)
Charge press hPa: 1000	2nd speed 1/min: 1180
TD travel mm: 3.403.80	+ Charge press. hPa: 1000
mm: (2.904.30)	+ Shutoff
Shutoff	electromagnet Volt: 24
electromagnet Volt: 24 4th speed 1/min: 500	- Del. quantity cm3/: 0.003.00 - 1000s.: (0.003.00)
Charge press hPa: 1000	3rd speed 1/min: 1120
TD travel mm: 1.702.50	Charge press. hPa: 1000
mm: (1.402.80)	+ Shutoff
Shutoff	+ electromagnet Volt: 24
electromagnet Volt: 24 TD travel mm: 0.006.40	Del. quantity cm3/: 15.0055.00 1000s.: (15.0055.00)
TD travel mm: 0.006.40 - mm: (0.001.00)	+ 5th speed 1/min: 1100
iiii. (0.001.00)	Charge press. hPa: 1000
Supply-pump pressure characteristic:	Shutoff
	electromagnet Volt: 24
1st speed	Del. quantity cm3/: 59.0065.00
Charge press. hPa: 1000	1000S.: (56.0068.00) + 9th speed 1/min: 1050
Supply-pump - pressure bar: 3.904.50 -	Charge press. hPa: 1000
Shutoff -	+ Shutoff
electromagnet Volt: 24	+ electromagnet Volt: 24
3rd speed 1/min: 750 -	Del. quantity cm3/: 76.5079.50
Charge press. hPa: 1000	10008.: (75.0081.00)
Supply-pump - pressure bar: 5.005.60 -	12th speed 1/min: 750
pressure bar: 5.005.60 - Shutoff -	Charge press. hPa: 1000 Shutoff
electromagnet Volt: 24	electromagnet Volt: 24
4th speed 1/min: 1050	Del. quyntity cm3/: 89.5090.50
Charge press. hPa: 1000	1000\$.: (87.0093.00)
Supply-pump -	18th speed 1/min: 500
pressure bar: 6.306.90	Charge press. hPa: -
Shutoff - electromagnet Volt: 24 -	+ Shutoff + electromagnet Volt: 24
ececti dilagnet vocc. 24	Del. quantity cm3/: 63.5064.50
Overlow quantity at overflow valve:	10005.: (60.0068.00)
1st speed 1/min: 500	Mech. shutoff:
Charge press. hPa: -	Mech. Abstellung:
Shutoff -	+
electromagnet Volt: 24	1st speed 1/min: 1050
Overflow : 41.7083.40 - quantity cm3/10s: (26.7098.40) -	Del. quantity cm3/: 0.003.00 1000S.: (0.003.00)
2nd speed 1/min: 1050	Shutoff
Charge press. hPa: 1000	electromagnet volt: 24

Electr. shutoff:

1000s.: (0.00...3.00)

Shutoff

electromagnet volt: -

Idle delivery:

1st speed 1/min: 375

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 8.00...14.00

1000s.: (6.00...16.00) cm3/: 5.5

Dispersion

1000s.: (7.0) 1/min: 450 2nd speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 0.00...4.00

1000s.: (0.00...4.00)

Automatic starting fuel delivery:

1st speed 1/min: 130

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 60.00...140.00 1000S.: (60.00...140.00)

1/min: 230 2nd speed

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 20.00...60.00 1000s.: (20.00...60.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 60.00...140.00

1000s.: (60.00...140.00)

Shutoff electromagnet:

Cut-in

min voltage : 20,0 : 24,0

Rated voltage

Mounting and assembly dimensions:

Designation

mm: -

K KF

MS

mm: 5,0...5,4 mm: 1,0...1,4

SVS max.

mm: 2,2

Remarks:

: C.D.C. # 391 7517

Operate control lever after each manifold pressure compensator pressure change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timingdevice-travel measuring device with metal jacket

H26

Note inst. in remarks column

: CUM 3,9 P36 Test scheet

Edition : 15.07.91

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/12F1100R374-3

: 0 460 424 080 Type number

Customer Part-No. :

Customer-specific information

Customer

: 4 BTA 3.9 Engine

KW: 80 Power Speed 1/min: 2200

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil return temp.

with thermometer: 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening |

bar: 250.00...253.00 Pressure

Perforated-plate

mm: 0,5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

Prestroke mm: 0.3

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke

mm: 1,55 mm: +-0,02(0,06)

Outlet

Injection-pump setting values

Test specifications in parentheses

Timing-device travel

1/min: 750 Speed Charge press. hPa: 1000 Setting value mm: 3.80...4.20

electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 750 Charge press hPa: 1000 Setting value bar: 5.10...5.70

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850 Charge press. hPa: 1000

Del. quantity cm3/

1000s.: 85.50...86.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4.0

1000s.: (4.5)

Full-load del. w/out charge press.:

1/min: 500 Speed

Del. quantity cm3/

1000s.: 63.50...64.50

Shutoff

electromagnet Volt: 12

Low-idle speed regulation

1/min: 375 Speed

Del. quantity cm3/ 1000s.: 8.00...14.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1145 Speed Charge press hPa: 1000

Del. quantity cm3/ 1000s.: 65.00...71.00

KSB/AFB

Volt: 12 valve

Start:

1/min: 100 Speed

H27

Del. quantity cm3/: mind 1000S.: Shutoff	<b>65.00</b>		55.60139.00
electromagnet Volt:	12	quantity cm3/10s:	(40.60154.00)
Inspection-pump tes Test specifications		Delivery—quant. and	breakaway char.:
Timing-device chara	cteristic:	1nd speed 1/min: Charge—air pressure	
2nd speed 1/min:		point hPa:	350
	1000 +	Shutoff electromagnet Volt:	12
mm: Shutoff	(4.906.30)	Del. quantity cm3/: 1000s.:	81.5082.50
electromagnet Volt:	12	2nd speed 1/min:	1250
3rd speed 1/min:	750 +	Charge press. hPa:	
	1000 +	Shutoff	40
	3.804.20 (3.304.70)	electromagnet Volt:	
Shutoff	5.304.70	Del. quantity cm3/:	(0.003.00)
electromagnet Volt:	12	3rd speed 1/min:	1180
4th speed 1/min:	500 +	Charge press. hPa:	
Charge press hPa:	1000 +	Shutoff	40
	2.102.90 +	electromagnet Volt: Del. quantity cm3/:	12
Shutoff	(1.605.20)	1000s.:	(15.0055.00)
electromagnet Volt:	12 🗼	5th speed 1/min:	
_	· +	Charge press. hPa:	1000
Supply-pump pressur	e characteristic: +	Shutoff	10
1st speed 1/min:	500	electromagnet Volt: Del. quantity cm3/:	65 00 71 00
	1000	10005.:	(62.0074.00)
Supply-pump	+	9th speed 1/min:	1100
pressure bar: Shutoff	4.004.60	Charge press. hPa: Shutoff	1000
electromagnet Volt:	12	electromagnet Volt:	12
2nd speed 1/min:		Del. quantity cm3/:	76.0079.00
Charge press. hPa:	1000 +	1000s.:	(74.5080.50)
Supply-pump	F 10 F 70	10th speed 1/min:	1000
Shutoff	5.105.70	Charge press. hPa: Shutoff	1000
electromagnet Volt:	12 🗼	electromagnet Volt:	12
3rd speed 1/min:	1100	Del. quantity cm3/:	78.5081.50
	1000 +		(76.5083.50)
Supply-pump pressure bar:	6.707.30	12th speed 1/min: Charge press. hPa:	
Shutoff	J. 107.50	Shutoff	1000
electromagnet Volt:	12 +	electromagnet Volt:	12
Ougalou augastitu ot	- tonflow valva	Del. quyntity cm3/:	85.5086.50
Overlow quantity at	over tow valve:	18th speed 1/min:	(83.0089.00) 500
1st speed 1/min:		Charge press. hPa:	
Charge press. hPa:	- +	Shutoff	12
Shutoff electromagnet Volt:	12	electromagnet Volt: Del. quantity cm3/:	14 43 50 4/ 50
Overflow :	41.7083.40	1000s	(60.0068.00)
quantity cm3/10s:		, 333314	.52.02
2nd speed 1/min:	1100	Mech. shutoff:	
Charge press. hPa:	1000 +	Mech. Abstellung:	

1/min: 1100 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Electr. shutoff: 1/min: 375 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1st speed 1/min: 375 Shutoff electromagnet Volt: 12
Del. quantity cm3/: 8.00...14.00
1000s.: (6.00...16.00)
Dispersion cm3/: 5.5 1000s.: (7.0) 1/min: 455 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) Automatic starting fuel delivery: 1/min: 130 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 65.00...125.00 1000s.: (65.00...125.00) 1/min: 240 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 35.00...65.00 1000s.: (35.00...65.00) 4th speed 1/min: 100 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 65.00...105.00 1000s.: (65.00...105.00) Shutoff electromagnet: Cut-in min voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation

mm: -

J01

KF mm: 5,0...5,4 mm: 1,0...1,4 svs max. mm: 2,4 xk mm: 21.8...23.8 xL mm: 11.4...14.8

Remarks:

change.

: C.D.C. # 391 7020 Operate control lever after each manifold-pressure compensator pressure

\* Correction at adjusting nut (46)

Overflow restriction 0.55 mm - Part No. ..303

Note inst. in remarks column

: CUM 3,9 N30 Test scheet : 12.07.91 Edition

replaces

Calibrating oil : ISO 4113

: VE4/12F1100R378-8 Injection pump : 0 460 424 081 Type number

Customer-specific information

Customer : CDC

: 4 BT Engine

KW: 67 Power 1/min: 2200 Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer: 40.0...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0,30...0,40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

Pressure bar: 250.00...253,00

Perforated plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6 x Wall thickness : 2 mm: 840 x Length

Start of delivery

Prestroke mm: 0.3

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1,8

mm: +0,02(0,06)

Outlet : A

Injection-pump setting values Test specifications in parentheses

Timing-device travel

1/min: 900 Speed

Setting value mm: 2,3...2,7

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 900 Speed

Setting value bar: 4,1...4,7

Shutoff

electromagnet Volt: 12

Full-load del. w/out charge press.:

1/min: 900

Del. quantity cm3/ 1000s.: 68,0...69.0

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4,0 1000s.: (4,5)

Low-idle speed regulation

1/min: 475 Speed

Del. quantity cm3/

1000s.: 10,5...16,5

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5,5 1000S.: (7,0)

Full-load speed regulation

1/min: 1175 Speed

Del. quantity cm3/

1000s.: 32,5...37,5

Shutoff

electromagnet Volt: 12

Start:

1/min: 100 Speed Del. quantity cm3/: -mind 1000s.: 65,0

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750

TD travel mm: 1,3...2,1 mm: (1,0...2,4) electromagnet Volt: 12

2nd speed -1/min: 900

J02

TD travel mm:	2,32,7 (1,83,2)	†	Del. quanti	ty cm3/:	65,568,5 (64,070,0)
Shutoff	(1,03,2)	I	5th speed	1/min:	900
electromagnet Volt:	12	+	Shutoff		
3rd speed 1/min:	1100 -	╁	electromagne	et Volt:	12
	3,44,1	†	Del. quanti	ty cm3/:	68,069,0_
mm:	(3,04,4)	†	6+b apad	1000S.:	(65,571,5)
Supply-pump pressure	e characteristic:	Ŧ	6th speed Shutoff electromagne	1/min:	
1st speed 1/min:	500	I	Del quanti	tv cm3/:	70,074,0
Supply—pump	-	1	Joe. quarrer	1000s.:	(68,076,0)
pressure bar:	2,32,9	+	7th speed	1/min:	500´
Shutoff	-	+	Shutoff		40
electromagnet Volt:	12 -	t	electromagne	et Volt:	12
2nd speed 1/min:	900 -	T	bet. quantit	ty cmb/:	70,078,0 (68,080,0)
Supply-pump pressure bar:	4,14,7	Ι		10005	(00,000,0)
Shutoff	7/17/1	I	Mech. shuto1	ff:	
electromagnet Volt:	12 -		Mech. Abstel		
3rd speed 1/min:	1100 -	ł		-	
Supply-pump	-	+	1st speed	1/min:	1100
	4,95,5	t	Del. quantit	ty cm3/:	0,03,0
Shutoff	- 13	t	Ch. 4-44	1000s.:	-
electromagnet Volt:	12	Ī	Shutoff electromagne	at valt.	12
Overlow quantity at	overflow valve:	I	etecti onagi id	or vocc.	12
over con quarterly as	-	1	Electr. shut	toff:	
1st speed 1/min:	500 -	-			
Shutoff	-	+	1st speed	1/min:	475
electromagnet Volt:	12 -		Del. quantit	ty $cm3/$ :	0,03,0
Overflow : quantity cm3/10s:	4183		Shutoff	+	
2nd speed 1/min:			electromagne	et vott:	<del></del>
Shutoff	1100	L	Idle deliver	٠٧:	
electromagnet Volt:	12 -	-		<i>y</i> -	
Overflow :	55138		1st speed	1/min:	475
quantity cm3/10s:	(40154)		Shutoff		40
Dalitimus minute and	handler and about	t	electromagne	t Volt:	12
Delivery-quant. and	breakaway char.:	Ĺ	bet. quantit	1000s ·	10,516,5 (8,518,5)
	]		2nd speed	1/min:	550
1nd speed 1/min:	1230		Shutoff		<del>-</del>
Shutoff	-	-	electromagne		
electromagnet Volt:		<b>-</b>	Del. quantit		
Del. quantity cm3/:		-		1000s.:	-
1000s.: 2nd speed 1/min:			Automatic et	arting :	fuel delivery:
Shutoff	כווי		MULUMALIC SI	arting	idet detivery.
electromagnet Volt:	12	_	1st speed	1/min:	130
Del. quantity cm3/:	32,537,5		Shutoff		
1000s.:	(30,040,0)		electromagne		
3rd speed 1/min:	1160	<b> </b>	Del. quantit	y cm3/:	80,0120,0
Shutoff	42	<b>-</b>		1000s.:	_
electromagnet Volt:	16 3/, 0 71 0		2nd speed	1/min:	2//0
Del. quantity cm3/: 1000s.:	□ □		2nd speed Shutoff	171101111	240
4th speed 1/min:			electromagne	t Volt:	12
Shutoff	-		Del. quantit		
electromagnet Volt:	12	-	,	1000s.:	- ' '

# Shutoff electromagnet:

Cut-in min voltage Rated voltage : 10,0 : 12,0

Mounting and assembly dimensions:

Designation

K KF MS mm: mm: 5,0...5,4 mm: 1,1...1,5 mm: 3,2 SVS max.

Overflow restriction 0.55 mm - Part No. ..303

Note inst. in remarks column

: CUM 5.9 R Test scheet Edition : 15.07.91 : 10.85 replaces Calibrating oil : ISO-4113

Injection pump : VE6/12F1325R198 Type number : 0 460 426 063

Customer Part-No. :

Customer-specific information Customer

: 6 BT 5.9 IND. Engine

KW: 97 1/min: 2650 Power Speed

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Openina |

bar: 250.00...253.00 Pressure

Perforated plate

diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +0.02(0.04)

Start of delivery block mm: 1,5 Piston stroke

mm: +0,02(0,06)

Outlet |

Injection-pump setting values Test specifications in parentheses Timing-device travel

1/min: 850 Speed

Setting value mm: 3.90...4.30

Shutoff

electromagnet Volt: 24

Supply-pump pressure

1/min: 850 Speed

Setting value bar: 3.90...4.50

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1100

Del. quantity cm3/ 1000s.: 56.00...57.00

Shutoff

electromagnet Volt: 24 cm3/: 4.0 Dispersion 1000s.: (4.5)

Low-idle speed regulation

1/min: 375 Speed

Del. quantity cm3/

1000s.: 8.00...14.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1400 Speed

Del. quantity cm3/ 1000s.: 36.00...42.00

Shutoff

electromagnet Volt: 24

Start:

Speed 1/min: 100 Del. quantity cm3/: 60.00...110.00

1000s.: 60.00 mind

Shutoff

electromagnet Volt: 24

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100

mm: 5.90...6.70 TD travel

mm: (5.60...7.00)

Shutoff	P Del. quantity cm3/: 36.0042.00
electromagnet Volt: 24	1000\$.: (33.0045.00)
3rd speed 1/min: 850 -	9th speed
TD travel mm: 3.904.30	Shutoff
mm: (3.404.80)	electromagnet Volt: 24
Shutoff	Del. quantity cm3/: 52.5055.50
electromagnet Volt: 24	1000s.: (51.0057.00)
4th speed 1/min: 500	- 11th speed
TD travel mm: 1.302.10	- Shutoff
mm: (1.002.40)	- electromagnet Volt: 24
Shutoff	- Del. quantity cm3/: 53.5057.50
electromagnet Volt: 24	- 1000S.: (51.5059.50)
-	12th speed
Supply-pump pressure characteristic:	- Shutoff
· · · · · · · · · · · · · · · · · · ·	- electromagnet Volt: 24
1st speed 1/min: 500	Del. quyntity cm3/: 56.0057.00
Supply-pump	- 1000s.: (53.5059,50)
pressure bar: 2.503.10	- 20th speed 1/min: 500
Shutoff	- Shutoff
electromagnet Volt: 24	- electromagnet Volt: 24
2nd speed 1/min: 850	Del. quantity cm3/: 38.5046.50
Supply-pump	- 1000s.: (36.5048.50)
pressure bar: 3.904.50	1000011 (0013011110130)
Shutoff	- Mech. shutoff:
electromagnet Volt: 24	- Mech. Abstellung:
3rd speed 1/min: 1100	L
Supply-pump +	- 1st speed 1/min: 1325
pressure bar: 4.905.50	- Del. quantity cm3/: 0.003.00
Shutoff	- 1000s.: (0.003.00)
electromagnet Volt: 24	- Shutoff
etectromagnet vott. 24	- electromagnet volt: 24
Overlow quantity at overflow valve:	etectionagnet vott. 24
over tow quantity at over tow valve.	- - Electr. shutoff:
1st speed 1/min: 500	etectr. Silutori.
Shutoff	- 1st speed 1/min: 375
	- Del. quantity cm3/: 0.003.00
electromagnet Volt: 24 Overflow: 41.7083.40	- 1000s.: (0.903.00)
	- Yous.: (0.905.00) - Shutoff
quantity cm3/10s: (26.7098.40)	
2nd speed 1/min: 1325	- electromagnet volt: -
Shutoff	- Talla alala (a.u.)
electromagnet Volt: 24	- Idle delivery:
Overflow : 55.60139.00	- 1-+ 1/: 775
quantity cm3/10s: (40.60154.00)	- 1st speed 1/min: 375
<b>T</b>	- Shutoff
Delivery-quant. and breakaway char.:	- electromagnet Volt: 24
†	- Del. quantity cm3/: 8.0014.00
1	- 1000 <u>s</u> .: (6.0016.00)
2nd speed 1/min: 1520 +	- Dispersion cm3/: 5.5
Shutoff	- 1000s.: (7.0)
electromagnet Volt: 24	- 2nd speed 1/min: 450
Del. quantity cm3/: 0.003.00 +	- Shutoff
10005.: (0.003.00)	- electromagnet Volt: 24
4th speed 1/min: 1440	- Del. quantity cm3/: 0.004.00
Shutoff	- 1000s.: -
electromagnet Volt: 24	•
Del. quantity cm3/: 15.0045.00	- Automatic starting fuel delivery:
1000s.: (15.0045.00)	-
5th speed 1/min: 1400 +	- 1st speed 1/min: 130
Shutoff	- Shutoff
electromagnet Volt: 24	- electromagnet Volt: 24

Del. quantity cm3/: 65.00...115.00 1000s.: (65.00...115.00)

2nd speed 1/min: 250

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 15.00...65.00 1000s.: (15.00...65.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 60.00...110.00 1000S.: (60.00...110.00)

Shutoff electromagnet:

Cut-in

: 20.0 : 24.0 min voltage Rated voltage

Mounting and assembly dimensions:

Designation

K mm: -

mm: 5,0...5,4 mm: 1,3...1,7 mm: 20,2...22,2 mm: 9,1...12,5 KF MS

XK

XL

Remarks:

: C.D.C. # 390 8217

Note inst. in remarks column

Test scheet : PER 6,0 C : 15.07.91 Edition : 06.11.89 replaces Calibrating oil : ISO-4113

: VE6/12F1300R240 Injection pump Type number : 0 460 426 084

Customer Part-No. :

Customer-specific information Customer : PERKINS

: T6 60 cc Truck Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 020 assembly

Opening

bar: 172.00...175.00 Pressure

Perforated-plate

diameter mm: 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

mm: 0,25 Prestroke

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 1,0

mm: +-0.02(0.06)

Outlet

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value mm: 1.30...1.70

electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 1100 Charge press hPa: 1000

Setting value bar: 6.50...7.10

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

1/min: 700 Speed Charge press. hPa: 1000

Del. quantity cm3/

1000s.: 99.00...100.00

Shutoff

electromagnet Volt: 24 cm3/: 5.0 Dispersion 1000s.: (5.0)

Full-load del. w/out charge press.:

1/min: 700 Speed Del. quantity cm3/

1000s.: 87.00...88.00

Shutoff

electromagnet Volt: 24

Low-idle speed regulation

1/min: 300 Speed

Del. quantity cm3/

1000\$.: 16.50...20.50

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 5.0 1000s.: (5.0)

Full-load speed regulation

1/min: 1450 Charge press hPa: 1000

Del. quantity cm3/

1000s.: 47.00...53.00

Shutoff

electromagnet Volt: 24

Start:

1/min: 100 Speed

Del. quantity cm3/: 120.00...160.00

1000s.: 120,0

Shutoff

electromagnet Volt: 24

J08

Inspection-pump test specifications Test specifications in parentheses Delivery-quant. and breakaway char.: 1nd speed 1/min: 700\* Timing-device characteristic: Charge-air pressure-setting 1/min: 1300 s hPa: 1000 mm: 2.00...2.80 mm: (1.70...3.10) hPa: 400 2nd speed Charge press LDA-stroke mm: 6,3 TD travel Shutoff electromagnet Volt: 24
Del. quantity cm3/: 95.00...96.00
1000S.: (92.50...98.50)
2nd speed 1/min: 1520
Charge press. hPa: 1000
Shutoff Shutoff electromagnet Volt: 24 3rd speed 1/min: 1100 3rd speed Charge press hPa: 1000 TD travel mm: 1.30...1.70 mm: (0.80...2.20) Shutoff electromagnet Volt: 24 4th speed 1/min: 1000 Charge press hPa: 1000 Charge press. hPa: 1000 Shutoff mm: 0.40...1.20 TD travel electromagnet Volt: 24

Del. quantity cm3/: 0.00...7.00

1000s.: (0.00...7.00)

5th speed 1/min: 1450 mm: (0.00...1.40) Shutoff electromagnet Volt: 24 Charge press. hPa: 1000 Shutoff Supply-pump pressure characteristic: electromagnet Volt: 24
Del. quantity cm3/: 47.00...53.00
1000S.: (44.00...56.00)
9th speed 1/min: 1300 1st speed 1/min: 1300 Charge press. hPa: 1000 Supply-pump pressure bar: 7.30...7.90 Charge press. hPa: 1000 Shutoff Shutoff electromagnet Volt: 24 2nd speed 1/min: 1100 electromagnet Volt: 24
Del. quantity cm3/: 95.00...98.00
1000S.: (93.50...99.50)
10th speed 1/min: 1000
Charge press. hPa: 1000
Shutoff Charge press. hPa: 1000 Supply-pump pressure bar: 6.50...7.10 Shutoff electromagnet Volt: 24 3rd speed 1/min: 500 electromagnet Volt: 24
Del. quantity cm3/: 99.50...102.50
1000S.: (98.00...104.00)
12th speed 1/min: 700 Charge press. hPa: 1000 Supply-pump pressure bar: 3.90...4.50 Charge press. hPa: 1000 Shutoff Shutoff electromagnet Volt: 24 Overlow quantity at overflow valve: 1st speed 1/min: 500 Charge press. hPa: -Charge press. hPa: -Shutoff Shutoff electromagnet Volt: 24
Del. quantity cm3/: 87.00...88.00
1000S.: (84.50...90.50)
20th speed 1/min: 500 electromagnet Volt: 24 : 41.70...83.40 quantity cm3/10s: (26.70...98.40) 2nd speed 1/min: 1300 Charge press. hPa: 1000 Shutoff Charge press. hPa: -Shutoff electromagnet Volt: 24 Overflow : 55.60...139.00 electromagnet Volt: 24 Del. quantity cm3/: 81.00...82.00 1000S.: (78,5...84,50) quantity cm3/10s: (40.60...154.00)

Mech. shutoff: Mech. Abstellung:

1/min: 1300 1st speed

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Shutoff

electromagnet volt: 24

Electr. shutoff:

1/min: 300 1st speed

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Shutoff

electromagnet volt: -

Idle delivery:

1st speed 1/min: 300

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 16.50...20.50

1000s.: (13.50...23.50)

cm3/: 5.0 Dispersion

1000s.: (5.0) 1/min: 350

2nd speed

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 4.50...10.50 1000s.: (2.50...12.50)

1/min: 400 4th speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 0.00...2.60

1000s.: (0.00...2.60)

Automatic starting fuel delivery:

1/min: 150 1st speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 120.00...160.00 1000S.: (95.00...145.00)

1/min: 230 2nd speed

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 35.00...85.00 1000s.: (35.00...85.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 120.00...160.00

1000s.: (120.00...160.00)

Shutoff electromagnet:

Cut-in

: 20,0 : 24,0 min voltage

Rated voltage

Mounting and assembly dimensions:

Designation

mm: -

KF mm: K-OT

MS mm: 0,6...1,0

SVS max. LDA stroke

mm: 3,2 mm: 6,3 mm: 17,0...19,0 XK

mm: 12,8...16,2 XL

Remarks:

Operate control lever after each manifold-pressure compensator pressure change.

\* Correction at adjusting nut (46)

Note inst. in remarks column

: PER 6,0 A Test scheet Edition : 15.07.91 : 18.04.88 replaces : ISO-4113 Calibrating oil

: VE6/12F1300R241 Injection pump : 0 460 426 085 Type number

Customer Part-No. :

Customer-specific information Customer : PERKINS

: T6 60 Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 020 assembly

Opening

bar: 172.00...175.00 Pressure

Perforated plate

mm: 0,6 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

Prestroke mm: 0.3

(from BDC): +0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100 Charge press. hPa: 1000 Setting value mm: 2.10...2.50

Setting value

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 1100

Charge press hPa: 1000 Setting value bar: 7.20...7.80

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 1000 Speed Charge press. hPa: 1000

Del. quantity cm3/ 1000s.: 92.00...93.00

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 3.5 1000s.: (3.5)

Full-load del. w/out charge press.:

1/min: 700

Del. quantity cm3/

1000s.: 77.50...80.50

Shutoff

electromagnet Volt: 12

Low-idle speed regulation

1/min: 350 Speed

Del. quantity cm3/ 1000s.: 13.00...17.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 3.5 1000s.: (3.5)

Full-load speed regulation

Speed 1/min: 1400 Charge press hPa: 1000

Del. quantity cm3/ 1000s.: 52.00...58.00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100

Del. quantity cm3/: 90.00...130.00 mind 1000s.: 90.00

mind

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1300	+ Charge-air pressure-setting
Charge press hPa: 1000	+ point hPa: 350
TD travel mm: 2.903.70	+ LDA-stroke mm: 6,1
mm: (2.604.00)	+ Shutoff
Shutoff electromagnet Volt: 12	+ electromagnet Volt: 12 + Del. quantity cm3/: 83.5084.50
3rd speed 1/min: 1100	10005.: (81.0087.00)
Charge press hPa: 1000	2nd speed 1/min: 1480
TD travel mm: 2.102.50	+ Charge press. hPa: 1000
mm: (1.603.00)	+ Shutoff
Shutoff	+ electromagnet Volt: 12
electromagnet Volt: 12	+ Del. quantity cm3/: 8.0016.00
4th speed 1/min: 950	† 1000s.: (5.0019.00)
Charge press hPa: 1000	+ 3rd speed 1/min: 1530
TD travel mm: 0.501.10	+ Charge press. hPa: 1000
mm: (0.101.50)	+ Shutoff
Shutoff	+ electromagnet Volt: 12 + Del. quantity cm3/: 0.003.00
electromagnet Volt: 12	1000S.: (0.003.00)
Supply-pump pressure characteristic:	5th speed 1/min: 1400
supply pump pressure endracter racte.	Charge press. hPa: 1000
1st speed 1/min: 1300	+ Shutoff
Charge press. hPa: 1000	+ electromagnet Volt: 12
Supply-pump	+ Del. quantity cm3/: 52.0058.00
pressure bar: 8.008.60	+ 1000s.: (49.0061.00)
Shutoff	+ 9th speed 1/min: 1300
electromagnet Volt: 12	+ Charge press. hPa: 1000
2nd speed 1/min: 1100	+ Shutoff
Charge press. hPa: 1000	<pre>+ electromagnet Volt: 12 + Del. quantity cm3/: 84.5087.50</pre>
Supply-pump pressure bar: 7.207.80	+ 1000s.: (83.0089.00)
Shutoff	10th speed 1/min: 700
electromagnet Volt: 12	Charge press. hPa: 1000
3rd speed 1/min: 700	+ Shutoff
Charge press. hPa: 1000	+ electromagnet Volt: 12
Supply-pump	<pre>Del. quantity cm3/: 90.0093.00</pre>
pressure bar: 5.506.10	+ 1000s.: (88.5094.50)
Shutoff	12th speed 1/min: 1000
electromagnet Volt: 12	+ Charge press. hPa: 1000
	+ Shutoff
Overlow quantity at overflow valve:	electromagnet Volt: 12
1st speed 1/min: 500	Del. quyntity cm3/: 92.0093.00 1000s.: (89.5095.50)
Charge press. hPa: 1000	18th speed 1/min: 700
Shutoff	Charge press. hPa: -
electromagnet Volt: 12	+ Shutoff
Overflow : 41.7083.40	+ electromagnet Volt: 12
quantity cm3/10s: (26.7098.40)	<pre>Del. quantity cm3/: 77.5080.50</pre>
2nd speed 1/min: 1300	+ 1000S.: (76.0082.00)
Charge press. hPa: 1000	20th speed 1/min: 500
Shutoff	Charge press. hPa: -
electromagnet Volt: 12	+ Shutoff
Overflow : 55.60139.00	electromagnet Volt: 12
quantity cm3/10s: (40.60154.00)	Del. quantity cm3/: 71.5074.50 1000s.: (70.0076.00)
Delivery-quant. and breakaway char.:	10003 (70.0070.007
Decirely quality and bicanaway that	Mech. shutoff:
,	Mech. Abstellung:
1nd speed 1/min: 700*	+
	+ 1st speed 1/min: 1300

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Electr. shutoff: 1/min: 350 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1st speed 1/min: 350 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 13.00...17.00 1000s.: (10.00...20.00) cm3/: 3.5 Dispersion 1000s.: (3.5) 1/min: 400 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 4.00...10.00 1000s.: (2.00...12.00) 4th speed 1/min: 450 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...2.60 1000s.: (0.00...2.60) Automatic starting fuel delivery: 1/min: 150 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 100.00...140.00 1000s.: (100.00...140.00) 1/min: 250 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.00...70.00 1000s.: (40.00...70.00) 1/min: 100 4th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 90.00...130.00 1000s.: (90.00...130.00) Shutoff electromagnet: Cut-in min voltage : 10.0 : 12.0 Rated voltage

Mounting and assembly dimensions:

#### Remarks:

Operate control lever after each manifold—pressure compensator pressure change.

\* Correction at adjusting nut (46)

J13

Note inst. in remarks column

Test scheet : CUM 5,9 L10 Edition : 15.07.91 replaces : 28.03.90 Calibrating oil : ISO-4113

: VE6/12F1100R173-7 Injection pump : 0 460 426 089 Type number

Customer Part-No. :

Customer-specific information Customer : CDC

: 6 BTA-590 I Engine

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00: 42.00...50.00 Electronically

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

Pressure bar: 250.00...253.00

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

mm: 0,3 Prestroke

(from BDC): +0.02(0.04)

Start of delivery block mm: 1,85 Piston stroke

mm: +-0.02(0.06)

Outlet

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 900 Setting value mm: 2.00...2.40

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 900 Speed

Setting value bar: 4.30...4.90

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 750 Speed

Del. quantity cm3/

1000s.: 68.50...69.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 4.0

1000s.: (4.5)

Low-idle speed regulation

Speed 1/min: 375

Del. quantity cm3/ 1000s.: 9.00...13.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1150

Del. quantity cm3/

1000s.: 52.00...58.00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100 Speed

Del. quantity cm3/: 60.00...120.00 mind 1000s.: 60.00

mind

Shutoff

electromagnet Volt: 12

Inspection—pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1100

mm: 2.60...3.40 mm: (2.30...3.70) TD travel

Shutoff

electromagnet Volt: 12 1/min: 900 3rd speed

Del. quantity cm3/: 52.00...58.00 1000s.: (49.00...61.00) mm: 2.00...2.40 TD travel mm: (1.50...2.90) 1/min: 1100 9th speed Shutoff electromagnet Volt: 12 4th speed 1/min: 700 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 64.00...67.00 1000s.: (62.50...68.50) TD travel mm: 0.70...1.50 mm: (0.40...1.80) 1/min: 900 Shutoff 10th speed Shutoff electromagnet Volt: 12 Supply-pump pressure characteristic: 1/min: 500 1st speed Supply-pump Shutoff pressure bar: 2.30...2.90 electromagnet Volt: 12 Del. quyntity cm3/: 68.50...69.50 1000s.: (66.00...72.00) Shutoff electromagnet Volt: 12 2nd speed 1/min: 900 Supply-pump bar: 4.30...4.90 pressure Delivery-quant, and breakaway char.: Shutoff electromagnet Volt: 12 3rd speed 1/min: 1100 Inj.-qty.values,temp.-compensated temperatura Supply-pump pressure bar: 4.90...5.50 1000s.: (0.00...3.00) Shutoff electromagnet Volt: 12 Mech. shutoff: Mech. Abstellung: Overlow quantity at overflow valve: 1st speed Shutoff 1/min: 500 electromagnet Volt: 12 Shutoff Overflow | : 41.70...83.40 electromagnet volt: 12 cm3/10s: (26.70...98.40) 1/min: 1100 quantity 2nd speed Electr. shutoff: Shutoff electromagnet Volt: 12 Overflow : 55.60...139.00 1st speed 1/min: 375 Del. quantity cm3/: 0.00...3.00 cm3/10s: (40.60...154.00) 1000s.: (0.00...3.00) *auantity* Shutoff Delivery-quant. and breakaway char.: electromagnet volt: -Idle delivery: 1/min: 1220 2nd speed Shutoff 1/min: 375 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 9.00...13.00 1000s.: (6.00...16.00) Dispersion cm3/: 5.5 1000s.: (7.0) 2nd speed 1/min: 430 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 15.00...55.00 1000s.: (15.00...55.00) Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) 1/min: 1150 5th speed Shutoff electromagnet Volt: 12 Automatic starting fuel delivery:

1/min: 140 1st speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 60.00...120.00 1000s.: (60.00...120.00)

1/min: 240 2nd speed

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 30.00...60.00 1000s.: (30.00...60.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 60.00...120.00 1000s.: (60.00...120.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0 : 12.0 Rated voltage

Mounting and assembly dimensions:

Designation

mm: -mm: 5,0...5,4 mm: 1,2...1,6 mm: 2,7 mm: 20,2...22,2 mm: 11,2...14,6 K KF MS

SVS max.

XK

XL

Remarks:

: C.D.C. #390 4731

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column : CUM 5,9 W35 Test scheet Copl. date: : 12.07.91 **Edition** : 19.04.90 replaces : ISO-4113 Calibrating oil Injection pump : VE6/12F1100R376 Type number : 0 460 426 147 Customer Part-No.: 391 7559 Customer-specific information Customer : CDC Engine : 6 BT- 5.9 IND Speed 1/min: 1100 TEST BENCH REQUIREMENTS Calibrating oil return temb. with thermometer : 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar: 0.30...0.40 Calibrating nozzle-holder assembly : 1 688 901 027 Opening Pressure bar: 250.00...253.00 Perforated-plate diameter mm: 0.5 Test ini. tubing : 1 680 750 017 Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length Start of delivery Prestroke mm: 0,3 (from BDC): +0.2(0.04)Start of delivery block Piston stroke

mm: 1,5 mm: +-0,02(0,06) Outlet Injection pump setting values Test specifications in parentheses Timing-device travel

1/min: 750 Speed Setting value mm: 3.10...3.50 Shutoff electromagnet Volt: 12 Supply-pump pressure 1/min: 750 Speed Setting value bar: 4.10...4.70 Shutoff electromagnet Volt: 12 Full-load del. with charge press.: 1/min: 750 Del. quantity cm3/ 1000s.: 80.00...81.00 Shutoff electromagnet Volt: 12 Dispersion cm3/: 4.01000s.: (4.5) Low-idle speed regulation 1/min: 400 Speed Del. quantity cm3/ 1000s.: 6.00...12.00 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0) Full-load speed regulation Speed 1/min: 1150 Del. quantity cm3/ 1000s.: 50.50...56.50 Shutoff electromagnet Volt: 12 Start: Speed 1/min: 100 Del. quantity cm3/: 80.00...140.00 mind 1000s.: 80.00 Shutoff electromagnet Volt: 12 Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1/min: 1100

mm: 5.60...6.40

mm: (5.30...6.70)

Shutoff electromagnet Volt: 12 3rd speed 1/min: 750

2nd speed

TD travel

mm: 3.10...3.50 Shutoff TD travel electromagnet Volt: 12 Del. quantity cm3/: 68.50...71.50 1000s.: (67.00...73.00) mm: (2.60...4.00) Shutoff electromagnet Volt: 12 4th speed 1/min: 500 1/min: 900 10th speed mm: 1.00...1.80 Shutoff TD travel electromagnet Volt: 12
Del. quantity cm3/: 72.50...75.50
1000s.: (70.50...77.50)
12th speed 1/min: 750 mm: (0.70...2.10) Shutoff electromagnet Volt: 12 Supply-pump pressure characteristic: Shutoff electromagnet Volt: 12 Del. quyntity cm3/: 80.00...81.00 1/min: 500 1st speed 1000s.: (77.50...83,50) Supply-pump 1/min: 500 bar: 3.00...3.60 pressure 20th speed Shutoff Shutoff electromagnet Volt: 12 2nd speed 1/min: 750 electromagnet Volt: 12 1000s.: (82.00...90.00) 2nd speed Supply-pump pressure bar: 4.10...4.70 Mech. shutoff: Shutoff Mech. Abstellung: electromagnet Volt: 12 3rd speed 1/min: 1100 Supply-pump bar: 5.70...6.30 1000s.: (0.00...3.00) pressure Shutoff Shutoff electromagnet Volt: 12 electromagnet volt: 12 Electr. shutoff: Overlow quantity at overflow valve: 1/min: 500 1/min: 400 1st speed 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet Volt: 12 : 41.70...83.40 Overflow | Shutoff cm3/10s: (26.70...98.70) electromagnet volt: quantity 1/min: 1100 2nd speed Idle delivery: Shutoff electromagnet Volt: 12 : 55.60...139.00 1st speed 1/min: 400 Overflow cm3/10s: (40.60...154.00) Shutoff quantity electromagnet Volt: 12 Del. quantity cm3/: 6.00...12.00 Delivery-quant. and breakaway char.: 1000s.: (4.00...14.00) cm3/: 5.5 1000s.: (7.0) Dispersion 2nd speed 1/min: 1230 Shutoff 1/min: 470 2nd speed electromagnet Volt: 12 Del. quantity cm3/: 0.00...3.00 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) 1/min: 1165 1000s.: (0.00...3.00) 3rd speed Shutoff Automatic starting fuel delivery: 1/min: 130 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 95.00...165.00 1000s.: (95.00...165.00) Shutoff 1/min: 250 9th speed 2nd speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 55.00...95.00 1000s.: (55.00...95.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 80.00...140.00 1000s.: (80.00...140.00)

#### Shutoff electromagnet:

Cut-in

min voltage : 10,0 Rated voltage : 12,0

## Mounting and assembly dimensions:

Designation

K mm: -

mm: 5,0...5,4 mm: 1,2...1,6 KF MS

SVS max. mm: 1,8

mm: 18,8...20,8 mm: 11.9...15,3 XΚ XL

Remarks:

: C.D.C. # 391 7559

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

Note inst. in remarks column

Test scheet : CUM 5,9 W63
Edition : 12.07.91
replaces : 20.06.90
Calibrating oil : ISO-4113

Injection pump : VE6/12F1300R377-1 Type number : 0 460 426 174

Customer Part-No. :

Customer—specific information Customer : CUMMINS

Engine : 6 BT 5.9 A

Power KW: 217 Speed 1/min: 2600

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 343

Calibrating-oil return temp. °C

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

Pressure bar: 250.00...253.00

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery

Prestroke mm: 0,3

(from BDC): +0.02(0.04)

Start of delivery block Piston stroke mm: 2.35

mm: +-0,02(0,06)

Outlet : D

Injection-pump setting values

Test specifications in parentheses

Timing-device travel

Speed 1/min: 850 Charge press. hPa: 1000

Setting value mm: 2.60...3.00

Shutoff

electromagnet Volt: 24

Supply-pump pressure

Speed 1/min: 850 Charge press hPa: 1000

Setting value bar: 6.60...7.20

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 850 Charge press. hPa: 1000

Del. quantity cm3/

1000s.: 73.50...74.50

Shutoff

electromagnet Volt: 24 Dispersion cm3/: 4.0 1000s.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 500

Del. quantity cm3/

1000s.: 50.50...51.50

Shutoff

electromagnet Volt: 24 Dispersion cm3/: 9.0 1000s.: (9.0)

Low-idle speed regulation

Speed 1/min: 350

Del. quantity cm3/

1000s.: 9.00...11.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 5.5 1000S.: (7.0)

Full-load speed regulation

Speed 1/min: 1400 Charge press hPa: 1000

Del. quantity cm3/

1000s.: 54.00...60.00

Shutoff

electromagnet Volt: 24

Start:

J20

Speed 1/min: 100 Del. quantity cm3/: 60.00...140.00 mind 1000S.: 60.00 Shutott electromagnet Volt: 24 : 111.20...194.60 Shutoff cm3/10s: (96.20...209.60) Shutoff quantity electromagnet Volt: 24 Delivery-quant. and breakaway char.: Inspection-pump test specifications Test specifications in parentheses 1nd speed 1/min: 700\* Timing-device characteristic: Charge-air pressure-setting hPa: 475 1/min: 1300 hPa: 1000 mm: 2.90...3.70 mm: (2.60...4.00) LDA-stroke 2nd speed mm: -Shutoff Charge press electromagnet Volt: 24
Del. quantity cm3/: 63.00...64.00
1000S.: (59.50...67.50)
2nd speed 1/min: 1600 TD travel Shutoff electromagnet Volt: 24 3rd speed 1/min: 850 Charge press. hPa: 1000 Shutoff hPa: 1000 Charge press electromagnet Volt: 24
Del. quantity cm3/: 0.00...3.00
1000S.: (0.00...3.00)
3rd speed 1/min: 1480
Charge press. hPa: 1000
Shutoff TD travel mm: 2.60...3.00 mm: (2.10...3.50) Shutoff electromagnet Volt: 24
4th speed 1/min: 700
Charge press hPa: 1000
TD travel mm: 1.40...2.20
mm: (1.10...2.50) electromagnet Volt: 24 Del. quantity cm3/: 15.00...55.00 1000s.: (15.00...55.00) Shutoff n speed 1/min: 1400 Charge press. hPa: 1000 Shutoff electromagnet Volt: 24 Supply-pump pressure characteristic: 1st speed 1/min: 500 Charge press. hPa: 1000 Supply-pump pressure Charge press. hPa: 1000 Shutoff bar: 4.80...5.40 Shutoff electromagnet Volt: 24
Del. quantity cm3/: 66.00...69.00
1000S.: (64.50...70.50)
10th speed 1/min: 1100
Charge press. hPa: 1000
Shutoff electromagnet Volt: 24 2nd speed 1/min: 850 Charge press. hPa: 1000 Supply-pump pressure bar: 6.60...7.20 Shutoff electromagnet Volt: 24 3rd speed 1/min: 1300 Charge press. hPa: 1000 electromagnet Volt: 24 Del. quantity cm3/: 69.50...72.50 1000s.: (67.50...74.50) 1/min: 850 Supply-pump 12th speed Charge press. hPa: 1000 Shutoff bar: 8.60...9.20 pressure Shutoff electromagnet Volt: 24 Overlow quantity at overflow valve: 1st speed Shutoff 1/min: 500 Shutoff electromagnet Volt: 24 Del. quantity cm3/: 50.50...51.50 1000\$:: (47.00...55.00) electromagnet Volt: 24 : 104.25...145.95 cm3/10s: (89.25...160.95) Overflow 1/min: 500 quantity 20th speed 1/min: 1300 2nd speed Charge press. hPa: 1000 Charge press. hPa: 1000

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: -1000S:: (81,50...91,50)

Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1300

Charge press. hPa: 1000

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Shutoff

electromagnet volt: 24

Electr. shutoff:

1/min: 350 1st speed

Charge press. hPa: -

Del. quantity cm3/: 0.00...3.00

1000s.: (0.00...3.00)

Shutoff

electromagnet volt: -

Idle delivery:

1st speed 1/min: 350

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 9.00...11.00

1000s.: (5.00...15.00)

cm3/: 5.5 Dispersion

1000s.: (7.0)

1/min: 450 2nd speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 0.00...4.00

1000s.: (0.00...4.00)

Automatic starting fuel delivery:

1/min: 250 1st speed

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 50.00...110.00 1000s.: (50.00...110.00)

1/min: 400 2nd speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 20.00...60.00

1000s.: (20.00...60.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 60.00...140.00

1000s.: (60.00...140.00)

Shutoff electromagnet:

Cut-in

: 20.0 min voltage

Rated voltage

: 24.0

Mounting and assembly dimensions:

Designation

mm: -

K KF mm: K-OT

MS mm: 1,2...1,6

SVS max.

mm: 2,2 mm: 21,8...23,8 XK mm: 10,2...13.6 XL

Remarks:

: C.D.C. # 391 6987

Operate control lever after each

manifold-pressure compensator pressure

change.

\* Correction at adjusting nut (46)

Heavy-duty fuel-injection pump for DI-engines: only test using timingdevice-travel measuring device with

metal jacket

Note inst. in remarks column

: CUM 5,9 W80 Test scheet Edition : 22.05.91

replaces

Calibrating oil : ISO-4113

Injection pump : VE6/12F1250R419 Type number : 0 460 426 184

Customer Part-No.: 391 8991

Customer-specific information : CDC

Customer

Engine : 6 BTA 590A

1/min: 1250 Speed

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil

with thermometer: 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 109 assembly

Opening |

Pressure bar: 207.00...210.00

Perforated plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery Prestroke mm: -

(from BDC): -

Start of delivery block Piston stroke mm: 1.25

mm: +-0.02(0.06)

Outlet

Injection pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1000 Charge press. hPa: 1000 Setting value mm: 1.60...2.00

Shutoff

electromagnet Volt: 12

Supply-bump pressure

Speed 1/min: 1000 Charge press hPa: 1000 Setting value bar: 6.30...6.90

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 850 Charge press. hPa: 1000

Del. quantity cm3/ 1000s.: 85.00...86.00

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 5.0 1000s.: (5.0)

Full-load del. w/out charge press.:

1/min: 500

Del. quantity cm3/

1000s.: 59.50...60.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 5.0 1000s.: (6.0)

Low-idle speed regulation

1/min: 400 Speed

Del. quantity cm3/ 1000s.: 12.00...16.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 10008:: (7.0)

Full-load speed regulation

1/min: 1325 Speed Charge press hPa: 1000 Del. quantity cm3/ 1000s.: 75.00...81.00

Start:

Speed 1/min: 100

Del. quantity cm3/: 80.00...160.00 mind 1000s.: 80.00

Shutoff

electromagnet Volt: 12

J23

	+	Shutoff	
Inspection—pump test speci Test specifications in par		electromagnet Volt: Overflow : quantity cm3/10s:	41.7083.40
Timing-device characterist	cic:	2nd speed 1/min: Charge press. hPa:	1250
2nd speed 1/min: 1250 Charge press hPa: 1000 TD travel mm: 2.30 mm: (2.00.	3.10	Shutoff electromagnet Volt:	12 55.60139.00
Shutoff electromagnet Volt: 12	‡	Delivery-quant. and	breakaway char.:
3rd speed 1/min: 1000 Charge press hPa: 1000	1	4 - 1 1 4 / · · · · · ·	700
TD travel mm: 1.60 mm: (1.10.		1nd speed 1/min: Charge-air pressure	-setting
Shutoff electromagnet Volt: 12 4th speed 1/min: 850	Ī	point hPa: LDA-stroke mm: Shutoff	
Charge press hPa: 1000 TD travel mm: 0,80	.1.60	electromagnet Volt: Del. quantity cm3/:	12 82,5083,50
mm: (0,50. Shutoff	1,90)	1000s.: 2nd speed 1/min:	(79.0087.00)
electromagnet Volt: 12 5th speed 1/min: 450*	‡	Charge press. hPa: Shutoff	
Charge press. hPa: - TD travel mm: 2.00	.3,00 *	electromagnet Volt: Del. quantity cm3/:	0.003.00
mm: (1,80.	+	3rd speed 1/min:	
Supply-pump pressure chara	icteristic: +	Charge press. hPa: Shutoff	
1st speed 1/min: 850 Charge press. hPa: 1000 Supply-pump	‡	electromagnet Volt: Del. quantity cm3/: 1000s.:	12 15.0045.00 (15.0045.00)
pressure bar: 5.70 Shutoff	.6.30	5th speed 1/min: Charge press. hPa:	1325
electromagnet Volt: 12 2nd speed   1/min: 1000	‡	Shutoff electromagnet Volt:	12
Charge press. hPa: 1000 Supply-pump	+	Del. quantity cm3/:	75.0081.00 (72.0084.00)
pressure bar: 6.30 Shutoff	.6.90		1250 1000
electromagnet Volt: 12 3rd speed   1/min: 1250	‡	Shutoff electromagnet Volt:	12
Charge press. hPa: 1000 Supply—pump	‡	Del. quantity cm3/: 1000s.:	83.5088.50 (82.0090.00)
pressure bar: 7.40 Shutoff	.8.00	10th speed 1/min: Charge press. hPa:	
electromagnet Volt: 12 4th speed   1/min: 500	†	Shutoff	10
4th speed 1/min: 500 Charge press. hPa: 1000	<b>I</b>	electromagnet Volt: Del. quantity cm3/:	84.5089.50
Supply-pump pressure bar: 3.90	.4.50	1000S.: 12th speed 1/min:	(83.0091.00) 850
Shutoff electromagnet Volt: 12	‡	Charge press. hPa: Shutoff	
Overlow quantity at overflo	ow valve:	electromagnet Volt: Del. quyntity cm3/:	85.0086.00
1st speed 1/min: 500	1	1000S.: 18th speed 1/min:	(82.5088.50) 500
Charge press. hPa: -	+	Charge press. hPa:	-

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 59.50...60.50

1000s.: (56.00...64.00)

Mech. shutoff: Mech. Abstellung:

1st speed 1/min: 1250 Charge press. hPa: 1000

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)

Shutoff

electromagnet volt: 12

Electr. shutoff:

1/min: 400 1st speed Charge press. hPa: -

Del. quantity cm3/: 0.00...3.00

1000s.: (0.00...3.00)

Shutoff

electromagnet volt: -

Idle delivery:

1/min: 400 1st speed

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 12.00...16.00

1000S.: (9.00...19.00)

Dispersion cm3/: 5.5

1000s.: (7.0)

1/min: 460 2nd speed

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 0.00...3.00

1000s.: (0.00...3.00)

Automatic starting fuel delivery:

1/min: 130 1st speed

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 80.00...160.00

1000s.: (80.00...160.00)

1/min: 240 2nd speed

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 50.00...80.00 1000s.: (50.00...80.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 12

Del. quantity cm3/: 80.00...160.00

1000s.: (80.00...160.00)

Shutoff electromagnet:

Cut-in

: 10,0 min voltage : 12.0

Rated voltage

Mounting and assembly dimensions:

Designation

mm: 3,6...3,8 Κ KF mm: K-OT

MS mm: 0,7...1,1

Remarks:

Heavy-duty fuel-injection pump for DI-engines: only test using timingdevice-travel measuring device with

metal jacket

Operate control lever after each manifold-pressure compensator pressure change.

\* Unscrew KSB ball valve 2 mm

Note inst. in remarks column

: CUM 5,9 W81 Test scheet Edition : 22.05.91

replaces

Calibrating oil : ISO-4113

: VE6/12F1250R372-2 Injection pump : 0 460 426 185 Type number

Customer Part-No.: 391 6948

Customer-specific information

Customer : CDC

: 6BT-5.9 IND. Engine

KW: -Power 1/min: 1250 Speed

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42,00...50,00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening |

bar: 250.00...253.00 Pressure

Perforated-plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

Prestroke mm: 0,3

(from BDC): +-0.02(0.04)

Start of delivery block Piston stroke

mm: 1,3 mm: +-0,02(0,06)

Outlet

Injection-pump setting values Test specifications in parentheses Timing-device travel

Speed 1/min: 750

Setting value mm: 3.40...3.80

Shutoff

electromagnet Volt: 24

Supply-pump pressure

1/min: 750 Speed

Setting value bar: 3.50...4.10

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

1/min: 1100

Del. quantity cm3/ 1000s.: 73.00...74.00

Shutoff

electromagnet Volt: 24 cm3/: 4.0 Dispersion 1000s.: (4.5)

Low-idle speed regulation

1/min: 360 Speed

Del. quantity cm3/

1000s.: 8.00...14.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1300 Speed

Del. quantity cm3/

1000s.: 51.00...57.00

Start:

1/min: 100 Speed

Del. quantity cm3/: 60.00...120.00 mind 1000s.: 60.00

Shutoff

electromagnet Volt: 24

Inspection—pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed

1/min: 1100 mm: 5.20...6.00 mm: (4.90...6.30) TD travel

Shutoff

electromagnet Volt: 24 3rd speed 1/min: 750

mm: 3.40...3.80 mm: (2.90...4.30) Shutoff TD travel Shutoff electromagnet Volt: 24 4th speed 1/min: 500 mm: 1.30...2.10 Shutoff TD travel mm: (1.00...2.40) Shutoff electromagnet Volt: 24 Shutoff Supply-pump pressure characteristic: electromagnet Volt: 24 Del. quantity cm3/: 75.00...79.00 1000s.: -1/min: 500 1st speed Supply-pump 1/min: 1100 bar: 2.40...3.00 12th speed Shutoff pressure Shutoff electromagnet Volt: 24 2nd speed 1/min: 750 2nd speed Supply-pump bar: 3.50...4.10 pressure Shutoff Shutoff electromagnet Volt: 24 Del. quantity cm3/: 64.00...72.00 1000s.: (62.00...74.00) electromagnet Volt: 24 3rd speed 1/min: 1100 Supply-pump pressure bar: 4.80...5.40 Shutoff Mech. shutoff: electromagnet Volt: 24 Mech. Abstellung: Overlow quantity at overflow valve: 1/min: 500 1st speed Shutoff Shutoff electromagnet volt: 24 electromagnet Volt: 24 : 41.70...83.40 cm3/10s: (26,70...98.40) 1/min: 1250 Overflow quantity 2nd speed Electr. shutoff: Shutoff electromagnet Volt: 24 : 55.60...139.00 Overflow ~ cm3/10s: (40.60...154.00) Shutoff quantity electromagnet volt: -Delivery-quant. and breakaway char.: Idle delivery: 1/min: 1400 1/min: 360 1st speed 2nd speed Shutoff Shutoff electromagnet Volt: 24

Del. quantity cm3/: 8.00...14.00

1000S.: (6.00...16.00)

Dispersion cm3/: 5.5

1000S.: (7.0)

2nd speed 1/min: 450 Shutoff Shutoff electromagnet Volt: 24 Del. quantity cm3/: 0.00...4.00 1000s.: (0.00...4.00) Shutoff electromagnet Volt: 24
Del. quantity cm3/: 51.00...57.00
1000S.: (48.00...60.00)
9th speed 1/min: 1250 Automatic starting fuel delivery: 1st speed 1/min: 130

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 70.00...130.00

1000s.: (70.00...130.00)

1/min: 240 2nd speed

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 30.00...70.00 1000s.: (30.00...70.00)

1/min: 100 4th speed

Shutoff

electromagnet Volt: 24

Del. quantity cm3/: 60.00...120.00 1000s.: (60.00...120.00)

#### Shutoff electromagnet:

Cut-in

: 20,0 : 24,0 min voltage Rated voltage

## Mounting and assembly dimensions:

Designation

mm: -

mm: 5,0...5,4 KF mm: 0,6...1,0 mm: 1,3 MS

SVS max.

mm: 18,8...20,8 XK mm: 11,1...14,5 XL

Remarks:

Values without check tolerance do not apply when checking pump.

Heavy-duty fuel-injection pump for DI-engines: only test using timingdevice-travel measuring device with metal jacket

Note inst. in remarks column

: CUM 5,9 W82 Test scheet : 22.05.91 Edition

replaces

Calibrating oil : ISO-4113

Injection pump : VE6/12F125OR419-1 Type number : 0 460 426 186 Customer Part-No. : 391 3442

Customer-specific information

Customer

: 6 BTA 590A Engine

KW: 118 Power 1/min: 2500 Speed

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 109 assembly

Opening

bar: 207.00...210.00 Pressure

Perforated-plate

mm: 0.5 diameter

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery Prestroke mm: -(from BDC): -

Start of delivery block Piston stroke mm: 1.25

mm: +-0.02(0.06)

Outlet | : D

Injection-pump setting values Test specifications in parentheses Timing-device travel

1/min: 1000 Speed Charge press. hPa: 1000

Setting value mm: 1.60...2.00

Shutoff

electromagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1000 Charge press hPa: 1000 Setting value bar: 6.30...6.90

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 850 Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 85.00...86.00

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 5.0 1000s.: (5.0)

Full-load del. w/out charge press.:

1/min: 500 Speed

Del. quantity cm3/ 1000s.: 59.50...60.50

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 5.0 1000s.: (6.0)

Low-idle speed regulation

1/min: 400

Del. quantity cm3/ 1000s.: 12.00...16.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 5.5 1000s.: (7.0)

Full-load speed regulation

1/min: 1325 Speed Charge press hPa: 1000

Del. quantity cm3/

1000s.: 75.00...81.00

Start:

Speed 1/min: 100 Del. quantity cm3/: 80.00...160.00

mind 1000s.: 80.00

Shutoff electromagnet Volt:	12	+	1st speed 1/min: Charge press. hPa: Shutoff	
Inspection-pump tes Test specifications	t specifications in parentheses	Ŧ	electromagnet Volt: Overflow quantity cm3/10s:	12 41.7083.40
Timing-device chara	cteristic:	Ī	2nd speed 1/min: Charge press. hPa:	1250
2nd speed 1/min: Charge press hPa:	1000	+	Shutoff electromagnet Volt:	12
	2.303.10 (2.003.40)	‡	Overflow : quantity cm3/10s:	55.60139.00 (40,60154.00)
Shutoff electromagnet Volt: 3rd speed 1/min:	12 1000	Ī	Delivery—quant. and	breakaway char.
Charge press hPa: TD travel mm:	1000 1.602.00	+	1nd speed 1/min:	700
Shutoff	(1.102.50)	‡	Charge-air pressure point hPa:	440
electromagnet Volt: 4th speed 1/min:	850	‡	LDA-stroke mm: Shutoff electromagnet Volt:	
Charge press hPa: TD travel mm: mm:	0,801,60 (0,501,90)	Ī	Del. quantity cm3/:	82,5083,50 (79.0087.00)
Shutoff electromagnet Volt:	12	+	2nd speed 1/min: Charge press. hPa:	1480
5th speed 1/min: Charge press. hPa:	_	+	Shutoff electromagnet Volt:	12
	2.003,00 * (1,803,20) *	†	Del. quantity cm3/: 1000S.: 3rd speed 1/min:	(0.003.00)
Supply-pump pressur	e characteristic:	<u> </u>	Charge press. hPa: Shutoff	
	850 1000	+	electromagnet Volt: Del. quantity cm3/:	15.0045.00
Supply-pump pressure bar: Shutoff	5.706.30	†	5th speed 1/min: Charge press. hPa:	(15.0045.00) 1325 1000
electromagnet Volt: 2nd speed 1/min:	12 1000	1	Shutoff electromagnet Volt:	
Charge press. hPa: Supply-pump	1000	+	Del. quantity cm3/: 1000s.:	75.0081.00 (72.0084.00)
pressure bar: Shutoff electromagnet Volt:	6.306.90	†	9th speed 1/min: Charge press. hPa: Shutoff	
3rd speed 1/min: Charge press. hPa:	1250	Ŧ	electromagnet Volt: Del. quantity cm3/:	83.5088.50
Supply-pump pressure bar: Shutoff	7.408.00	† †	10th speed 1/min:	
electromagnet Volt: 4th speed 1/min:		Ī	Charge press. hPa: Shutoff electromagnet Volt:	
Charge press. hPa: Supply-pump	1000	+	Del. quantity cm3/: 1000s.:	84.5089.50 (83.0091.00)
pressure bar: Shutoff	3.904.50	<del> </del>	12th speed 1/min: Charge press. hPa:	
electromagnet Volt:		†	Shutoff electromagnet Volt: Del. quyntity cm3/:	12
Overlow quantity at	OVELLOW VALVE.	I	1000S.:	(82.5088.50)

1/min: 500 18th speed Charge press. hPa: -Shutoff electromagnet Volt: 12 Del. quantity cm3/: 59.50...60.50 1000s.: (56.00...64.00) Mech. shutoff: Mech. Abstellung: 1/min: 1250 1st speed Charge press. hPa: 1000 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Electr. shutoff: 1/min: 400 1st speed Charge press. hPa: -Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1/min: 400 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 12.00...16.00 1000s.: (9.00...19.00) Dispersion cm3/: 5.5 1000s.: (7.0) 2nd speed 1/min: 460 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Automatic starting fuel delivery: 1/min: 130 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 80.00...160.00 1000s.: (80.00...160.00)

1/min: 240

electromagnet Volt: 12 Del. quantity cm3/: 50.00...80.00 1000S.: (50.00...80.00)

1/min: 100

Del. quantity cm3/: 80.00...160.00

1000s.: (80.00...160.00)

Shutoff electromagnet:

Cut-in

min voltage : 10,0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3,6...3,8 KF mm: K-OT MS mm: 0,7...1,1

Remarks:

Heavy-duty fuel-injection pump for DI-engines: only test using timing-device-travel measuring device with metal jacket

Operate control lever after each manifold-pressure compensator pressure change.

\* Unscrew KSB ball valve 2 mm

2nd speed Shutoff

4th speed Shutoff

electromagnet Volt: 12

Note remarks

Test sheet : KHD 15,8 c2 : 21.06.91 Edition : 3.6.91 Replaces : ISO-4113 Test oil

Combination no. : 0 400 649 188

Injection pump

Pump designation : PE10A95D610/4LS2452

EP type number : 0 410 699 998

Governor

Governor design. : RQV300...1150AB988DL

: 0 420 214 229 Governer no.

Customer-spec. information Customer : KHD

Engine : F10L413F

1st version kW : 216.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

**Opening** 

: 172...175 pressure, bar

: 1 680 750 014 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 Prestroke mm : (1.95...2.15)

Rack travel in mm : 9.00...12.00

K04

: 1- 10- 9- 4- 3- 6-Firing order

5- 8- 7- 2

: 0-27-72-99-144-171-Phasina

216-243-288-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm : 10.00...10.10

Del.quantity cm3/: 9.1...9.2

100 s: (8.9...9.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0 Rack travel in mm: 7.0...7.2 Del.quantity cm3/: 1.7...2.3

100 s: (1.4...2.5)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed : 1.10...1.60 travel mm

rpm : 340 2nd speed : 1.60...2.10 travel mm

: 710 3rd speed rpm

: 3.70...4.20 travel mm

: 1200 4th speed rpm

: 8.60...9.10 travel mm

rpm : 1390 5th speed

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1150 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

Del.quantity : 91.5...92.5

1000 : (89.5...94.5)

Spread cm3 : 3.00

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 9.00

rpm : 1190...1200 Speed

2nd rack travel in: 4.00

Speed rpm: 1235...1265 4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 80...88

Testing:

Speed rpm : 200 Minimum rack trave: 9.00 rpm : 300

Rack travel in mm : 5.90...6.10

: 750 Speed rpm Maximum rack trave: 1.00

CONSTANT REGULATION

rpm : 320...390 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

rpm : 1150 1st speed

Rack travel in m: 10.00...10.10

2nd speed rpm : 975

Rack travel in m: 10.20...10.40

3rd speed rpm : 700

Rack travel in m: 10.50...10.60

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700 Del.quantity cm3/: 90.0...93.0 1000 s: (87.5...95.5)

RACK STOP ADJUSTMENT

Speed rpm : 600

**BREAKAWAY** 

K05

1st version

1mm rack travel less than

full load rack tr: 9.00

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300

Rack travel in mm : 7.00...7.20 Del.quantity cm3/: 17.0...23.0

1000 s: (14.5...25.5)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

Note remarks

: HAN 10,8 h1 : 21.06.91 Test sheet Edition : 25.10.88 Replaces : ISO-4113 Test oil

Combination no. : 0 400 676 186

Injection pump

Pump designation: PE6A95D32ORS2557 EP type number : 0 410 696 986

Governor

Governor design. : RSV400...1100A8c1117

-1R

: 0 420 233 205 Governer no.

Customer-spec. information Customer : HANOMAG

Enaine : D963N

: 110.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 003

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.15...2.25 Prestroke mm

: (2.10...2.30)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 9.90...10.00

Del.quantity cm3/: 8.2...8.4

100 s: (8.0...8.6)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm: 8.0...8.2 Del.quantity cm3/: 3.1...3.9

100 s: (2.8...4.1)

cm3 : 0.3 Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 82.0...84.0 Del.quantity 1000 : (80.0...86.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 104...112

Testing:

1st rack travel in: 8.90

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1160...1190 Speed 3rd rack travel in: 4.00 Speed rpm : 1200...1230 4th rack travel in: 1365 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 74...82 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 7.6 Testina: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 400 Speed Rack travel in mm: 8.00...8.20 Rack travel in mm : 2.00 Speed rpm : 585...645 TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 9.90...10.00 2nd speed rpm: 500
Rack travel in m: 10.70...10.80
4th speed rpm: 865 Rack travel in m: 10.30...10.50 FUEL DELIVERY CHARACTERISTICS 1st version : 500 Speed rpm Del.quantity cm3/: 79.0...82.0 1000 s: (76.5...84.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.90 Speed rpm : 1140...1150 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 122.0...132.0 1000 s: (119.0...135.0) Rack travel in mm: 19.50...21.00 Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 4,0 a 2 Test sheet : 26.07.91 Edition : 11.7.88 Replaces : ISO-4113 Test oil : 0 400 844 088 Combination no. Injection pump Pump designation : PES4A90D410RS2666 EP type number : 0 410 894 029 Governor Governor design. : RQV300...1400AB1065-10L : 0 420 212 203 Governer no. Customer-spec. information Customer : DAIMLER-BENZ : 0M364 Engine 1st version kW : 66.0 : 2800 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 000 Inlet press., bar: 1.00 Test nozzle holder assembly : 0 681 343 009 Opening 1 : 172...175 pressure, bar Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values \_\_\_\_ BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.25...2.35

: (2.20...2.40)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2 : 0-90-180-270 Phasina Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1400 Rack travel in mm : 10.90...11.00 Del.quantity cm3/: 6.3...6.4 100 \$1 (6.1...6.6) cm3 : 0.3Spread 100 s: (0.4) rpm : 300.0 2nd speed Rack travel in mm : 8.6...8.8 Del.quantity cm3/: 0.8...1.2 100 s: (0.6...1.4) cm3 : 0.2Spread 100 s: (0.4) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 300 : 0.80...1.30 travel mm rpm : 500 2nd speed : 2.30...2.80 travel mm 3rd speed : 750 rpm : 4.10...4.30 travel mm : 1500 4th speed rpm : 8.50...8.60 travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1400 Speed : 63.5...64.5 Del.quantity 1000 : (61.5...66.5) : 3.00 Spread cm3 1000 : (4.50) RATED SPEED 1st version Control lever position degrees: 111...119 Testing: 1st rack travel in: 9.90

Prestroke mm

rpm : 1440...1450 Speed 2nd rack travel in: 4.00 Speed rpm : 1545...1575 4th rack travel in: 1700 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 72...80 Testing: Speed rpm : 100 Minimum rack trave: 10.20 : 300 Speed rpm Rack travel in mm : 8.60...8.80 CONSTANT REGULATION rpm : 540...680 Speed TORQUE CONTROL Dimension a mm : 1.00 Torque control curve - 1st version 1st speed rpm : 1400 Rack travel in m: 10.90...11.00 2nd speed rpm : 500 Rack travel in m: 12.00...12.20 3rd speed rpm : 700 Rack travel in m: 11.70...12.00 rpm : 900 4th speed Rack travel in m: 11.30...11.60 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version : 500 Speed rpm Del.quantity cm3/: 50.0...53.0 1000 s: (47.5...55.5) 1000 s: (5.) Speed rpm : 900 Del.quantity cm3/ : 52.5...55.5 1000 s: (50.0...58.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.90 rpm : 1440...1450 Speed STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0) Rack travel in mm: 16.60...17.00

Remarks:

K09

Speed

Note remarks

: IHC 7,6 w 3 : 18.06.91 Test sheet Edition : 5.10.90 Replaces : ISO-4113 Test oil

: 0 400 846 578 Combination no.

Injection pump

Pump designation : PES6A95D32ORS2779 EP type number : 0 410 896 903

Governor

: RQV350...1200AB1236-Governor design.

: 0 420 213 119 Governer no.

Customer—spec. information : NAVISTAR Customer

: DT 466 Engine

1st version kW : 145.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 038

Inlet press., bar: 2.80

Test nozzle holder

: 1 688 901 110 assembly

Opening

: 250...253 pressure, bar

Orifice plate

diameter mm : 0,5

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75 : (2.60...2.80)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 13.50...13.60

Del.guantity cm3/: 10.1...10.3

100 s: (9.9...10.5)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.0 2nd speed

Rack travel in mm: 5.9...6.1 Del.quantity cm3/: 1.7...2.1

100 s: (1.5...2.3)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1400 1st speed

: 8.60...9.00 travel mm 1250 2nd speed rpm

7.30...7.50 550 travel mm

3rd speed rpm

3.10...3.70 350 travel mm

4th speed rpm

: 1.30...1.70 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed Aneroid pressure h: 900

: 101.5...103.5 : (99.5...105.5) Del.quantity 1000

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 41...49

Testing:

1st rack travel in: 12.50

rpm : 1230...1260 Speed

2nd rack travel in: 4.00

rpm : 1385...1395 Speed

4th rack travel in: 1500

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

Speed : 100 rpm

Minimum rack trave: 9.00

rpni : 350 Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 350...500 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm

hPa : 900 Pressure

Rack travel mm : 13.50...13.60

Measurement

Speed 1/min : 500

1st pressure hPa : Rack travel in m: 9.90...10.10

2nd pressure hPa : 225

Rack travel in m: 10.90...11.00 3rd pressure hPa : 500

Rack travel in m: 12.50...12.90

START CUT-OUT

Speed

1/min: 270 (280)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 74.5...78.5 1000 s: (72.5...80.5)

**BREAKAWAY** 

K11

1st version

1mm rack travel less than

full load rack tr: 12.50

rpm : 1230...1260 Speed

INTERMEDIATE RATED SPEED Rack travel in mm: 4.00

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0 1000 s: (130.0...180.0)

Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm

Rack travel in mm : 5.90...6.10

Del.quantity cm3/: 17.0...21.0 1000 s: (15.0...23.0) Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

: NAVISTAR #1815517C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of

delivery of cylinder 1

Note remarks

Test sheet : IHC 7,6 y : 18.06.91 Edition : 15.11.90 Replaces : ISO-4113 Test oil

Combination no. : 0 400 846 579

Injection pump

Pump designation : PES6A95D32ORS2779 : 0 410 896 903 EP type number

Governor

Governor design. : RQV350...1350AB1248-

: 0 420 213 120 Governer no.

Customer-spec. information Customer : NAVISTAR

Engine : DT 360

: 126.0 1st version kW : 2700 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 038

Inlet press., bar: 2.80

Test nozzle holder

assembly : 1 688 901 110

Opening

: 250...253 pressure, bar

Orifice plate

diameter mm : 0,5

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.65...2.75 : (2.60...2.80)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1350 1st speed

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 8.4...8.6

100 s: (8.2...8.8)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 350.0 2nd speed Rack travel in mm: 5.9...6.1

Del.quantity cm3/: 1.7...2.1

100 s: (1.5...2.3)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

7.30...7.50 travel mm

1460 2nd speed rpm

: 8.10...8.50 travel mm

: 550 3rd speed rpm

: 3.10...3.70 travel mm

4th speed : 350 rpm

: 1.30...1.70 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1350 Aneroid pressure h: 900

: 84.0...86.0 Del.quantity 1000 : (82.0...88.0) cm3 : 3.50

Spread 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 44...52

Testing:

1st rack travel in: 11.30 rpm : 1390...1420 Speed

2nd rack travel in: 4.00 rpm : 1525...1535 Speed

4th rack travel in: 1625

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 11...19

Testing:

Speed : 100 rpm Minimum rack trave: 9.00 rpm : 350

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 350...500Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 900 Pressure

: 12.30...12.40 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.20...9.40

2nd pressure hPa : 240

Rack travel in m: 10.00...10.10 3rd pressure hPa : 435

Rack travel in m: 11.50...11.90

START CUT-OUT

1/min: 270 (280) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm\_ : 500 Speed

Del.quantity cm3/: 61.5...65.5

1000 s: (59.5...67.5)

**BREAKAWAY** 

K13

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 1390...1420 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0)

Rack travel in mm : 16.20...17.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 17.0...21.0

1000 s: (15.0...23.0)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

: NAVISTAR #1816726C91

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of

delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : IHC 7,6 y1 : 18.06.91 Test sheet Edition : 8.6.90 Replaces : ISO-4113 Test oil Combination no. : 0 400 846 580 Injection pump Pump designation : PES6A95D32ORS2779 EP type number : 0 410 896 903 Governor Governor design. : RQV350...1350AB1248-1R : 0 420 213 121 Governer no. Customer-spec. information Customer : NAVISTAR Engine : DTA 360 : 138.0 1st version kW : 2700 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 038 Inlet press., bar: 2.80 Test nozzle holder assembly : 1 688 901 110 Openina ( : 250...253 pressure, bar Orifice plate diameter mm : 0,5 Test lines : 1 680 750 008 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 2.65...2.75 Prestroke mm : (2.60...2.80) Rack travel in mm : 10.50 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75)Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1350 Rack travel in mm : 12.30...12.40 Del.quantity cm3/: 8.4...8.6 100 s: (8.2...8.8) cm3 : 0.3Spread 100 s: (0.6) 2nd speed rpm : 350.0Rack travel in mm: 5.9...6.1
Del.quantity cm3/: 1.7...2.1
100 s: (1.5...2.3) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1350: 7.30...7.50 : 1460 travel mm 2nd speed rpm : 8.10...8.50 travel mm : 550 3rd speed rpm : 3.10...3.70 travel mm 4th speed : 350 rpm : 1.30...1.70 travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1350 Aneroid pressure h: 900 Del.quantity : 84.0...86.0 1000 : (82.0...88.0) : 3.50 Spread cm3 1000 : (6.00)

RATED SPEED

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

1st version Control lever

position degrees: 44...52

Testing:

1st rack travel in: 11.30 Speed rpm: 1390...1420 2nd rack travel in: 4.00 Speed rpm: 1525...1535 4th rack travel in: 1625

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

Speed rpm : 100 Minimum rack trave: 9.00 : 350 Speed rpm

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 350...500 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom hPa : 900 Pressure

Rack travel mm : 12.30...12.40

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 215

Rack travel in m: 10.00...10.10

3rd pressure hPa : 430

Rack travel in m: 11.30...11.70

START CUT-OUT

1/min: 270 (280) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 67.0...71.0 1000 s: (65.0...73.0)

**BREAKAWAY** 

K15

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 1390...1420 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 145.0...165.0 1000 s: (140.0...170.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350 Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 17.0...21.0

1000 s: (15.0...23.0)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

: NAVISTAR #1816728091

Limit shutoff stop screw to 1.0 mm.

Start-of-delivery mark is at start of delivery of cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 6,2 s Test sheet : 26.07.91 Edition : 24.4.91 Replaces : ISO-4113 Test oil : 0 400 846 582 Combination no. Injection pump Pump designation : PES6A95D32ORS2796 EP type number : 0 410 896 901 Governor Governor design. : RQ300/1300AB1253-2R : 0 420 201 653 Governer no. Customer-spec. information Customer : DAF : NS 156G Engine 1st version kW : 156.0 : 2600 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 000 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening : 172...175 pressure, bar Test Lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 2.00...2.10 : (1.95...2.15) Prestroke mm

Rack travel in mm : 7.50...10.50

: 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 850 Rack travel in mm : 12.80...12.90 Del.quantity cm3/: 8.4...8.5 100 s: (8.2...8.7) cm3 : 0.3Spread 100 s: (0.6) rpm : 300.0 2nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 0.6...1.0 100 s: (0.3...1.2) cm3 : 0.3Spread 100 s: (0.5) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 770 Speed Rack travel in mm : 7.50...8.50 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 850 Aneroid pressure h: 1000 Del.quantity : 84.5...85.5 1000 : (82.5...87.5) : 3.50 cm3 Spread 1000 RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm: 8.0 Testing: 1st rack travel in: 11.60 Speed rpm : 1325...1340 2nd rack travel in: 4.00

rpm : 1410...1440

Speed

4th rack travel in: 1550 rpm : 0.00...1.00 Speed LOW IDLE 1 Setting point w/out bumper spring rpm Rack travel in mm: 6.5 Testing: Speed rpm : 100 Minimum rack trave: 7.70 Speed rpm: 300
Rack travel in mm: 6.40...6.60
Rack travel in mm: 2.00 rpm : 545...585 Speed TORQUE CONTROL Dimension a mm : 0.60 Torque control curve - 1st version rpm : 1290 1st speed Rack travel in m: 12.60...12.70 2nd speed rpm : 750 Rack travel in m: 14.20...14.80 3rd speed rpm : 960 Rack travel in m: 13.50...14.10 4th speed rpm : 1055 Rack travel in m: 12.90...13.30 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 12.80...12.90 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.80...11.00 2nd pressure hPa : 260 Rack travel in m: 12.30...12.40 3rd pressure hPa : 210 Rack travel in m: 11.30...11.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 1290 Del.quantity cm3/: 87.0...89.0 1000 s: (84.5...91.5) Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 44.5...45.5 1000 s: (42.5...47.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.60 Speed rpm : 1325...1340

LOW IDLE

Speed rpm: 300
Rack travel in mm: 6.40...6.60
Del.quantity cm3/: 6.0...10.0
1000 s: (3.5...12.5)
Spread cm3: 3.50

1000 s: (5.50)

Remarks:

Note remarks

: DAF 6,2 p 3 : 02.08.91 Test sheet Edition : 5.11.90 Replaces Test oil : ISO-4113

Combination no. : 0 400 846 583

Injection pump

Pump designation : PES6A95D32ORS2693 EP type number : 0 410 896 914

Governor

Governor design. : RQ300/1300AB1253R

Governer no. : 0 420 201 649

Customer-spec. information Customer : DAF

: NS 156 Engine

1st version kW : 156.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 : (1.95...2.15) Prestroke mm

Rack travel in mm : 7.50...10.50

K18

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.00...12.10

Del.guantity cm3/: 8.7...8.8

100 s: (8.5...9.0)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm : 6.3...6.5 Del.quantity cm3/: 0.6...1.0

100 s: (0.3...1.2)

cm3 : 0.3Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 850 Speed Rack travel in mm : 7.50...8.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 700

Del.quantity : 87.3...90.5)

: 3.50 Spread cm3

: (6.00) 1000

RATED SPEED

1st version

Setting point:

Speed rom Rack travel in mm : 8.0

Testing:

1st rack travel in: 11.00

rpm : 1335...1350 Speed

2nd rack travel in: 4.00

rpm : 1430...1460 Speed

LOW IDLE 1

Setting point w/out bumper sprina

rpm : 300 Rack travel in mm: 6.4

Testing:

Speed rpm : 100 Minimum rack trave: 7.70 Speed rpm : 300
Rack travel in mm : 6.40...6.50
Rack travel in mm : 2.00

: 540...580 Speed rpm

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

rpm : 1280 1st speed

Rack travel in m: 12.30...12.40

2nd speed rpm : 1000

Rack travel in m: 12.30...12.50

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm Pressure hPa : 700

: 12.00...12.10 Rack travel mm

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 290 Rack travel in m: 11.50...11.60

3rd pressure hPa : 250

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600 Del.quantity cm3/: 53.5...54.5 1000 s: (51.5...56.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.00

rpm : 1335...1350 Speed

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 6.0...10.0 1000 s: (3.5...12.5)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

Note remarks

: DAF 6,2 p 4 Test sheet : 26.07.91 Edition Replaces : 24.4.91

Test oil : ISO-4113

Combination no. : 0 400 846 585

Injection pump

Pump designation : PES6A95D32ORS2693

EP type number : 0 410 896 914

Governor

Governor design. : RQ300/1300AB1253-1R

Governer no. : 0 420 201 650

Customer-spec. information : DAF

Customer

Engine : NS 133

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10

: (1.95...2.15)

Rack travel in mm : 7.50...10.50

: 1-5-3-6-Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 11.50...11.60

Del.guantity cm3/: 7.6...7.7

100 s: (7.4...7.9)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.0 2nd speed Rack travel in mm : 6.3...6.5 Del.quantity cm3/: 0.6...1.0

100 s: (0.3...1.2) cm3 : 0.3

Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2 rpm : 725 Speed

Rack travel in mm : 7.50...8.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850 Aneroid pressure h: 700

: 76.5...77.5 : (74.5...79.5) Del.quantity 1000

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 8.0

Testing:

1st rack travel in: 9.50

rpm : 1335...1350 Speed

2nd rack travel in: 4.00

rpm : 1410...1440 Speed

4th rack travel in: 1550

rpm : 0.00...1.00Speed

LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.4 Testing: Speed rpm : 100 Minimum rack trave: 7.70 rpm : 300 Rack travel in mm: 6.30...6.50 Rack travel in mm: 2.00 Speed rpm: 525...565 TORQUE CONTROL Dimension a mm : 0.55 Torque control curve - 1st version rpm : 1290 1st speed Rack travel in m: 10.50...10.60 2nd speed rpm : 800 Rack travel in m: 11.80...12.40

3rd speed rpm : 950

Rack travel in m: 11.20...11.80

4th speed rpm : 1050

Rack travel in m: 10.70...11.10 Aneroid/Altitude Compensator Test 1st version Setting rpm : 600 hPa : 700 Speed rom Pressure : 11.50...11.60 Rack travel mm Measurement 1/min: 600 Speed 1st pressure hPa : -Rack travel in m: 10.10...10.30 2nd pressure hPa : 160 Rack travel in m: 10.70...10.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed rpm : 1290 Del.quantity cm3/ : 73.0...75.0 1000 s: (70.5...77.5) Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 50.5...51.5 1000 s: (48.5...53.5) **BREAKAWAY** 

1mm rack travel less than

full load rack tr: 9.50
Speed rpm : 1335...1350
LOW IDLE

Remarks:

K21

1st version

Note remarks

: DAF 6,2 p 5 : 21.06.91 Test sheet Edition Replaces : 24.4.91 : ISO-4113 Test oil

Combination no. : 0 400 846 586

Injection pump

Pump designation : PES6A95D32ORS2693 EP type number : 0 410 896 914

Governor

Governor design. : RQ300/1300AB1254R

: 0 420 201 651 Governer no.

Customer-spec. information Customer : DAF

Engine : NT 119

1st version kW : 119.0 : 2600 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening 1

pressure, bar : 172...175

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.00...2.10 : (1.95...2.15) Prestroke mm

Rack travel in mm : 7.50...10.50

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 2.50...3.50

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 6.1...6.2

100 s: (5.9...6.4)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm: 6.3...6.5 Del.quantity cm3/: 0.6...1.0

100 s: (0.3...1.2)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 850 Speed Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed

: 61.5...62.5 Del.quantity

1000 : (59.5...64.5)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version

Setting point:

Speed : 850 rpm Rack travel in mm : 20.0

Testing: 1st rack travel in: 9.30 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1410...1440 Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm: 6.4 Testing: Speed rpm : 100 Minimum rack trave: 7.70 rpm : 300 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 : 525...565 Speed rom TORQUE CONTROL Dimension a mm : 0.35 Torque control curve - 1st version 1st speed rpm : 1290
Rack travel in m: 10.30...10.40
2nd speed rpm : 850
Rack travel in m: 11.10...11.40 rpm : 975 3rd speed Rack travel in m: 10.70...11.00 rpm : 1025 4th speed Rack travel in m: 10.50...10.70 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1290 Del.quantity cm3/ : 68.0...70.0 1000 s: (65.5...72.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.30 rpm : 1340...1350 Speed LOW IDLE Speed rpm : 300 Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 6.0...10.0 1000 s: (3.5...12.5) cm3 : 3.50 Spread 1000 s: (5.50) Remarks:

APPLICATION

**Omnibus** 

Firing order : 1-5-3-6-2-4 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : 0-60-120-180-240-300 Test sheet : RAB 9,7 e Phasing : 26.07.91 Edition : 22.3.91 Tolerance + - ° : 0.50 (0.75) Replaces Test oil : ISO-4113 Time to cyl. no. : 0 400 846 588 Combination no. BASIC SETTING Injection pump Pump designation : PES6A95D42OLS28O4 rpm: 1050 1st speed EP type number : 0 410 896 899 Rack travel in mm : 12.00...12.10 Governor Governor design. : RQ200/1050AB1246-1R Governer no. : 0 420 201 652 Del.quantity cm3/: 11.9...12.1 Customer-spec. information 100 s: (11.7...12.3) Customer : RABA Spread cm3 : 0.3Engine : D2156 HM6 UT 100 s: (0.6) : 162.0 1st version kW rpm : 200.0 : 2100 Rated speed 2nd speed Rack travel in mm: 7.4...7.6 Del.quantity cm3/: 1.1...1.5 TEST BENCH REQUIREMENTS 100 s: (0.8...1.7) cm3 : 0.3Test oil Spread : 38...42 100 s: (0.5) inlet temp. °C GUIDE SLEEVE POSITION Overflow valve : 1 417 413 000 Control-lever position Degree: -2 rpm : 500 Inlet press., bar: 1.50 Speed Rack travel in mm : 19.20...20.80 Test nozzle holder : 0 681 343 009 FULL LOAD DELIV. AT FULL LOAD STOP assembly 1st version Openina Speed rpm : 1050 Aneroid pressure h: 700 : 172...175 pressure, bar Del.quantity 1000 : 119.0...121.0 : (117.0...123.0) Test lines : 1 680 750 014 Spread cm3 : 3.50Outside diameter 1000 : (6.00) x Wall thickness : 6.00X2.00X600 x Length mm RATED SPEED 1st version (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. Setting point: Speed rpm : 500 Rack travel in mm : 20.0 per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testing: 1st rack travel in: 11.00 : 1.80...1.90 rpm : 1095...1110 Prestroke mm Speed : (1.75...1.95) 2nd rack travel in: 4.00 rpm : 1125...1155 Rack travel in mm : 9.00...12.00 Speed

LOW IDLE 1 Setting point w/out bumper spring rpm : 200 Speed Rack travel in mm: 6.5 Testing: Speed : 100 rpm Minimum rack trave: 8.00 : 200 Speed rpm Rack travel in mm: 6.40...6.60 Rack travel in mm : 2.00 Speed rpm : 280...320 TORQUE CONTROL Dimension a mm : 0.40 Torque control curve - 1st version 1st speed rpm : 1050
Rack travel in m: 12.00...12.10
2nd speed rpm : 415 Rack travel in m: 13.10...13.50 d speed rpm : 680 Rack travel in m: 12.70...13.10 3rd speed 4th speed rpm : 835 Rack travel in m: 12.20...12.70 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 700 Speed rpm Pressure : 12.70...12.80 Rack travel mm Measurement 1/min : 500 Speed 1st pressure hPa : -Rack travel in m: 10.70...10.80 2nd pressure hPa : 260 Rack travel in m: 12.50...12.60 3rd pressure hPa : 180 Rack travel in m: 11.10...11.40 START CUT-OUT 1/min: 140 (160) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 rpm : 600 Speed

Del.quantity cm3/: 113.0...116.0

: 500

Aneroid pressure h: -

rpm

1000 s: (110.5...118.5)

Del.quantity cm3/: 74.0...76.0 1000 s: (72.0...78.0) RACK STOP ADJUSTMENT rpm : 500 Speed **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.00 rpm : 1095...1110 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 150.0...160.0 1000 s: (147.0...163.0) Rack travel in mm : 17.50...17.70 Remarks: Set idle stop at 200 min -1 to a control-rod travel of 6.5 mm APPLICATION **Omnibus** 

K25

Speed

Note remarks

Test sheet : MB 6,0 j 5 : 26.07.91 Edition

Replaces

Test oil : ISO-4113

: 0 400 846 593 Combination no.

Injection pump

: PES6A95D41ORS2797 Pump designation EP type number : 0 410 896 900

Governor

Governor design. : RQV300...1200AB1065-

25L

Governer no. : 0 420 212 229

Customer-spec. information

Customer : MERCEDES-BENZ

: OM 366 Engine

1st version kW : 92.0 : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.20...3.30 Prestroke mm

: (3.15...3.35)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasina

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

rpm : 12001st speed

Rack travel in mm : 9.90...10.00

Del.quantity cm3/ : 5.8...6.0

100 s: (5.6...6.2)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm: 8.6...9.0 Del.quantity cm3/: 0.8...1.2

100 s: (0.5...1.4)

cm3 : 0.3 Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 3001st speed

: 0.80...1.30 travel mm

500 2nd speed rpm :

2.30...2.80 750 travel mm

3rd speed rpm

: 4.10...4.30 travel mm

1500 4th speed rpm

: 8.50...8.60 travel mm

GUIDE SLEEVE POSITION Control-lever position

Dearee: -1

rpm : 1450 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Del quantity : 58.5...60.5

1000 : (56.5...62.5)

: 3.50 cm3 Spread

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 104...112

Testing:

1st rack travel in: 8.90

rpm : 1240...1250 Speed

2nd rack travel in: 4.00

rpm : 1360...1390 Speed

4th rack travel in: 1550

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 73...81

Testing:

: 100 Speed rpm Minimum rack trave: 9.60 : 300 Speed rpm

Rack travel in mm : 8.60...9.00

CONSTANT REGULATION

rpm : 525...625 Speed

TORQUE CONTROL

: 0.80 Dimension a mm

Torque control curve - 1st version

rpm : 1200 1st speed

Rack travel in m: 9.90...10.00

rpm : 500 2nd speed

Rack travel in m: 10.70...10.90

rpm : 840 4th speed

Rack travel in m: 10.20...10.50

START CUT-OUT

Speed

1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500 Del.quantity cm3/ : 44.0...47.0 1000 s: (41.5...49.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 8.90

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

K27

Del.quantity cm3/: 78.0...88.0 1000 s: (75.0...91.0)

Rack travel in mm : 14.60...15.00

Remarks:

Set shutoff stop to contact at 3.0...3.5 mm control-rod travel.

Note remarks

: MB 6,0 j 6 Test sheet

: 26.07.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 846 594

Injection pump

Pump designation : PES6A95D410RS2797 EP type number : 0 410 896 900

Governor

Governor design. : RQV300...1400AB1065-

26L

: 0 420 212 230 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM 366 Engine

: 95.0 1st version kW : 2800 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.20...3.30 Prestroke mm

: (3.15...3.35)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasina ; 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 14001st speed

Rack travel in mm : 2.90...10.00

Del.quantity cm3/: 5.8...6.0

100 s: (5.6...6.2)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm: 9.0...9.2 Del.quantity cm3/: 0.8...1.2

100 s: (0.5...1.4)

Spread cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300 : 0.80...1.30 travel mm

rpm : 500 2nd speed

: 2.30...2.80 travel mm

3rd speed : 750 rpm

: 4.10...4.30 travel mm

: 1500 4th speed rpm

: 8.50...8.60 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm: 1450 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1400

: 58.0...60.0 Del.quantity

: (56.0...62.0) : 3.50 1000

Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control Lever

position degrees: 109...117

Testing:

1st rack travel in: 8.90

rpm : 1450...1460 Speed

2nd rack travel in: 4.00

rpm : 1545...1575 Speed

4th rack travel in: 1670

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 71...79

Testing:

Speed rpm : 100 Minimum rack trave: 10.50 rpm : 300

Rack travel in mm : 9.00...9.20

CONSTANT REGULATION

rpm : 500...650 Speed

TORQUE CONTROL

Dimension a mm : 1.40

Torque control curve - 1st version

1st speed rpm : 1400

Rack travel in m: 9.90...10.00

rpm : 400 2nd speed

Rack travel in m: 11.30...11.60

3rd speed rpm : 650

Rack travel in m: 10.90...11.10

4th speed rpm : 900

Rack travel in m: 10.40...10.70

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 400 Speed

Del.quantity cm3/: 48.0...51.0 1000 s: (45.5...53.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.90

Speed rpm : 1450...1460

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 78.0...88.0
1000 s: (75.0...91.0)
Rack travel in mm : 14.60...15.00

Remarks:

Set shutoff stop to contact at 3.0...3.5 mm control-rod travel.

L01

Note remarks

: KHD 3,0 d : 21.06.91 : 28.11.88 Test sheet Edition Replaces Test oil : ISO-4113

: 0 400 863 013 Combination no.

Injection pump Pump designation : PES3A9OD410/3RS2740

EP type number : 0 410 893 006

Governor

: RSV325...1150A0C2219 Governor design.

: 0 420 232 466 Governer no.

Customer-spec. information Customer : KHD

: F3L913G Engine

1st version kW : 36.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening |

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.50...2.60 Prestroke mm

: (2.45...2.65)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 2

Phasina : 0-120-240

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

rpm: 650 1st speed

Rack travel in mm : 9.20...9.30

Del.guantity cm3/: 5.2...5.3

100 s: (5.0...5.5)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 375.0 Rack travel in mm : 5.9...6.1 Del.quantity cm3/: 1.1...1.7 100 s: (0.9...1.9)

cm3 : 0.2Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-Lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 650 Speed

: 52.0...53.0 Del.quantity : (50.0...55.0) 1000

: 3.00 cm3 Spread

1000 : (5.00)

RATED SPEED

1st version Control lever

position degrees: 107...115

Testing:

1st rack travel in: 8.10 Speed rpm : 1090...1100

2nd rack travel in: 4.00

rpm : 1120...1150 Speed

3rd rack travel in: 4.00

rpm : 1135...1165 Speed 4th rack travel in: 1300 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever position degrees: 74...82 Setting point w/out bumper spring Speed rpm : 375 Rack travel in mm : 5.5 Testing: : 100 Speed rpm Minimum rack trave: 19.50 Speed rpm : 375
Rack travel in mm : 5.90...6.10
Rack travel in mm : 2.00 Speed rpm : 495...555 TORQUE CONTROL Torque control curve - 1st version rpm : 650 1st speed Rack travel in m: 9.20...9.30 rpm : 350 2nd speed Rack travel in m: 9.30...9.60 3rd speed rpm : 1050 Rack travel in m: 9.10...9.30 FUEL DELIVERY CHARACTERISTICS 1st version : 350 Speed rpm Del.quantity cm3/: 45.0...47.0 1000 s: (42.5...49.5) Speed rpm : 1050 Del.quantity cm3/ : 63.5...65.5 1000 s: (61.0...68.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.10 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 57.0...67.0 1000 s: (54.0...70.0) Rack travel in mm : 10.70...10.90 Remarks:

Note remarks

: KHD 1 g 43 : 02.08.91 Test sheet Edition Replaces : 4.5.90 : ISO-4113 Test oil

: 0 400 864 074 Combination no.

Injection pump

Pump designation: PES4A85D410/3RS2638 EP type number : 0 410 884 950

Governor

Governor design. : RSV325..1150A0C2168-

4L

: 0 420 232 524 Governer no.

Customer-spec. information Customer : KHD

: BF4L913T Engine

1st version kW : 60.0 : 2300 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60

: (2.45...2.65)

Rack travel in mm : 9.00...12.00 Firing order : 1-3-4-2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1150 1st speed

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 7.1...7.2

100 s: (6.9...7.4)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 325.02nd speed Rack travel in mm: 8.8...9.0 Del.quantity cm3/: 1.6...2.2

100 s: (1.4...2.4)

cm3 : 0.2 Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1150 Speed

. 71.5...72.5 1000 : (69.5...74.5) Del.quantity

: 3.00 Spread cm3

1000 : (5.00)

RATED SPEED

1st version Control lever

position degrees: 101...109

Testing:

1st rack travel in: 10.40 Speed rpm : 1190...1200 2nd rack travel in: 4.00

rpm : 1270...1300 Speed

3rd rack travel in: 4.00

Speed rpm : 1330...1360 4th rack travel in: 1500 rpm : 0.30...1.40Speed LOW IDLE 1

Control lever position degrees: 76...84

Setting point w/out bumper spring

Speed rpm : 325 Rack travel in mm : 8.4

Testina:

: 100 Speed rpm Minimum rack trave: 19.50 : 325 Speed rpm Rack travel in mm : 8.80...9.00 Rack travel in mm : 2.00 rpm : 720...780 Speed

TORQUE CONTROL Torque control curve - 1st version rpm : 1150 1st speed Rack travel in m: 11.40...11.50 rpm : 500 2nd speed

Rack travel in m: 12.50...12.60

3rd speed rpm : 940

Rack travel in m: 11.90...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

: 800 rpm Speed

Del.quantity cm3/: 71.5...73.5 1000 s: (69.0...76.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.40

rpm : 1190...1200 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 125.0...135.0 1000 s: (122.0...138.0)

Rack travel in mm : 19.50...21.00

Remarks:

: DX3X

APPLICATION

Tractor (tractor engines)

L05

Note remarks

: MWM 4,1 b 6 : 26.07.91 Test sheet **Fdition** Replaces : 3.6.91 : ISO-4113 Test oil

Combination no. : 0 400 864 092

Injection pump

Pump designation : PES4A90D320/3RS2659 : 0 410 894 028

EP type number

Governor

Governor design. : RSV325...1250A5C2182

-9R

: 0 420 233 287 Governer no.

Customer—spec. information Customer : MWM

: TD226B-4 Engine

1st version kW : 87.0 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10) Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack tray. m: 9.00...0.00 & maximum rack tra: 21.00 Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 11.50...11.60

Del.guantity cm3/: 9.1...9.2

100 s: (8.9...9.4)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 325.02nd speed Rack travel in mm : 6.9...7.1 Del.quantity cm3/ : 0.8...1.4

100 s: (0.6...1.6)

cm3 : 0.2Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed rpm : 1250 Areroid pressure h: 700

: 91.5...92.5 Del.quantity 1000 : (89.5...94.5)

: 3.00 Spread cm3 : (5.00) 1000

RATED SPEED

1st version Control lever

position degrees: 103...111

1st rack travel in: 10.50

Speed rpm: 1345...1375 3rd rack travel in: 4.00 rpm : 1355...1385 Speed 4th rack travel in: 1520 Speed rpm : 0.30...1.40LOW IDLE 1 Control lever position degrees: 66...74 Setting point w/out bumper spring Speed rpm : 325 Rack travel in mm : 5.5 rpm Testing: Speed rpm : 100 Minimum rack trave: 19.50 : 325 rpm Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 rpm : 445...505 Speed TORQUE CONTROL Torque control curve – 1st version 1st speed rpm : 1250 Rack travel in m: 11.50...11.60 rpm : 500 2nd speed Rack travel in m: 12.50...12.60 3rd speed rpm : 920 Rack travel in m: 11.90...12.10 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm hPa : 700 Pressure : 12.50...12.60 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.40...10.50 2nd pressure hPa : 185 Rack travel in m: 11.60...11.70 3rd pressure hPa : 90 Rack travel in m: 11.00...11.20 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed rpm: 700 Del.quantity cm3/: 98.5...100.5 1000 s: (96.0...103.0) L07

rpm : 1290...1300

Speed

2nd rack travel in: 4.00

Aneroid pressure h: 85 Speed rpm: 500
Del.quantity cm3/: 79.0...81.0
1000 s: (76.5...83.5) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 61.0...63.0 1000 s: (59.0...65.0)

**BREAKAWAY** 

1st version 1mm rack travel less than full load rack tr: 10.50 rpm : 1290...1300 Speed

STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/: 132.0...142.0
1000 s: (129.0...145.0) Rack travel in mm : 19.50...21.00

Remarks:

Note remarks

: MWM 4,1 b 7 Test sheet Edition : 26.07.91

Replaces

Test oil : ISO-4113

: 0 400 864 093 Combination no.

Injection pump

Pump designation : PES4A90D320/3RS2659

EP type number : 0 410 894 028

Governor

Governor design. : RSV325...1250A5C505-

4R

: 0 420 233 288 Governer no.

Customer-spec. information Customer

: D226-B4 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05 : (2.90...3.10) Rack travel in mm : 9.00...12.00

: 1- 3- 4-Firing order

: 0-90-180-270 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...0.00 & maximum rack tra: 21.00

Difference ° CS : 3.50...4.50

BASIC SETTING

rpm: 1250 1st speed

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 9.0...9.1

100 s: (8.8...9.3)

Spread cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 325.0 Rack travel in mm : 7.2...7.4 Del.quantity cm3/: 0.8...1.4

100 s: (0.6...1.6)

cm3 : 0.2Spread 100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

: 90.0...91.0 Del.quantity 1000 : (88.0...93.0) : 3.00

cm3 Spread

1000 : (5.00)

RATED SPEED

1st version Control Lever

position degrees: 105...113

Testina:

1st rack travel in: 11.00

rpm : 1290...1300 Speed'

2nd rack travel in: 4.00 rpm : 1340...1370 Speed 3rd rack travel in: 4.00 Speed rpm : 1360...1390 4th rack travel in: 1520 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring rpm : 325 Rack travel in mm: 6.8 Testing: rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm: 325
Rack travel in mm: 7.20...7.40
Rack travel in mm: 2.00 rpm : 440...500 Speed TORQUE CONTROL Torque control curve - 1st version rpm : 1250 1st speed Rack travel in m: 12.00...12.10 rpm : 500 2nd speed Rack travel in m: 12.00...12.20 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.00 rpm : 1290...1300 Speed STARTING FUEL DELIVERY Remarks:

Note remarks

Test sheet : MWM 6,2 e 4 : 21.06.91 Edition

: 31.8.90 Replaces : ISO-4113 Test oil

Combination no. : 0 400 866 112

Injection pump

Pump designation : PES6A90D320/3RS2660

EP type number : 0 410 896 078

Governor

Governor design. : RSV325...1500A2C505-

2R

: 0 420 233 196 Governer no.

Customer—spec. information Customer : MWM

: D226-6 Engine

: 110.0 1st version kW : 3000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.95...3.05 Prestroke mm

: (2.90...3.10)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50 & maximum rack tra: 21.00

Difference ° CS : 3.50...4.50

BASIC SETTING

1st speed rpm: 1500

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 8.9...9.0

100 s: (8.7...9.2)

cm3 : 0.3Spread

100 s: (0.5)

rpm : 325.0 2nd speed Rack travel in mm: 7.0...7.2

Del.quantity cm3/: 0.8...1.4 100 s: (0.6...1.6)

cm3 : 0.2Spread

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting  $\bar{x}$ : 5.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1500

Del.quantity : 89.5...90.5 1000 : (87.5...92.5)

: 3.00 Spread cm3 1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 107...115

Testing: 1st rack travel in: 10.20 rpm : 1540...1550 Speed 2nd rack travel in: 4.00 Speed rpm : 1590...1620 3rd rack travel in: 4.00 Speed rpm : 1605...1635 4th rack travel in: 1780 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 68...76 Setting point w/out bumper spring rpm : 325 Rack travel in mm: 6.6 Testing: Speed rpm: 100 Minimum rack trave: 19.50 Speed rpm : 325 Rack travel in mm : 7.00...7.20 Rack travel in mm: 2.00 Speed : 460...520 rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1500 Rack travel in m: 11.20...11.30 2nd speed rpm : 500 Rack travel in m: 11.20...11.40 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.20 Speed rpm : 1540...1550 STARTING FUEL DELIVERY Remarks: APPLICATION Generator set

Note remarks

: CUM 8,3 a63 Test sheet : 08.07.91 Edition

: 18.2.91 Replaces : ISO-4113 Test oil

Combination no. : 0 400 866 132

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

: RSV500...1250A0C2190 Governor design.

-28R

: 0 420 233 231 Governer no.

Customer-spec. information Customer : C.D.C.

: 6 CT-T 8.3ltr. Engine

: 139.0 1st version kW : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

: 0,6 diameter mm

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)
Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1250

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 10.2...10.4

100 s: (10.0...10.6)

Spread cm3 : 0.4

100 s: (0.6)

rpm : 500.0 2nd speed Rack travel in mm: 5.5...5.7

Del.quantity cm3/: 1.3...1.7 100 s: (1.0...1.9)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

102.5...104.5 Del.quantity 1000 : (100.5...106.5)

cm3 : 4.00 Spread

1000 : (6.50)

RATED SPEED

1st version Control lever

position degrees: 43...51

Testing:

1st rack travel in: 10.40

rpm : 1315...1325 Speed

2nd rack travel in: 4.00

rpm : 1365...1375 Speed

3rd rack travel in: 4.00

rpm : 1365...1395 Speed 4th rack travel in: 1450

Speed rpm : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 19...27

Setting point w/out bumper spring

Speed rpm : 500 Rack travel in mm : 5.1

Testing:

rpm : 100 Speed Minimum rack trave: 19.00

Speed rpm: 500 Rack travel in mm: 5.50...5.70

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 10.40

rpm : 1315...1325 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 145.0...165.0

1000 s: (140.0...170.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm: 500 Rack travel in mm: 5.50...5.70 Del.quantity cm3/: 13.0...17.0 1000 s: (10.5...19.5)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: C.D.C. # 3915687

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm before stop.

Note remarks

: CUM 8,3 a66 : 08.07.91 Test sheet Edition Replaces : 18.2.91 Test oil : ISO-4113

Combination no. : 0 400 866 140

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

Governor design. : RSV400...1100A0C2190

-33R

: 0 420 233 237 Governer no.

Customer—spec. information Customer : C.D.C.

: 6 CTA 8.3ltr Engine

: 174.5 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wail thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)
Rack travel in mm : 10.50 \_

: 1-5- 3- 6- 2- 4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.8...13.0

100 s: (12.6...13.2)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 400.02nd speed Rack travel in mm : 5.5...5.7 Del.quantity cm3/: 1.4...1.8

100 s: (1.2...2.1)

cm3 : 0.6Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting  $\bar{x}$ :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Del.quantity : 128.0...132.0)

: 4.00 Spread cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 41...49

Testing:

L14

1st rack travel in: 11.70

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm: 1200...1230 3rd rack travel in: 4.00

Speed rpm : 1205...1235 4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 20...28

Setting point w/out bumper spring

Speed rpm : 400 Rack travel in mm: 5.1

Testing:

Speed rpm : 100 Minimum rack trave: 19.00 rpm : 400 Speed

Rack travel in mm : 5.50...5.70

## **BREAKAWAY**

1st version 1mm rack travel less than

full load rack tr: 11.70

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 145.0...165.0 1000 s: (140.0...170.0)

Rack travel in mm : 19.00...21.00

## LOW IDLE

: 400 Speed rpm

Rack travel in mm : 5.50...5.70 Del.quantity cm3/: 14.5...18.5 1000 s: (12.0...21.0)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: C.D.C # 3915967

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

: CUM 8,3 L10 : 08.07.91 : 14.12.90 Test sheet Edition Replaces : ISO-4113 Test oil

Combination no. : 0 400 866 148

Injection pump

Pump designation : PES6A100D320/3RS2763

: 0 410 806 006 EP type number

Governor

: RSV415...1175AOC2190-Governor design.

43R

: 0 420 233 249 Governer no.

Customer—spec. information : C.D.C Customer

Engine : 6 CT

1st version kW : 129.0 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. °C

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

: 1 Time to cyl. no.

BASIC SETTING

1st speed rpm: 1175

Rack travel in mm : 10.40...10.50

Del.quantity cm3/: 9.6...9.8

100 s: (9.4...10.0)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 415.02nd speed

Rack travel in mm : 5.1...5.3 Del.quantity cm3/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm3 : 0.6100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1175 Speed

: 96.0...98.0 Del.quantity 1000 : (94.0...100.0)

Spread cm3 : 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 56...64

Testing:

1st rack travel in: 9.40

rpm : 1240...1250 Speed

2nd rack travel in: 4.00

Speed rpm : 1295...1325 3rd rack travel in: 4.00

Speed rpm: 1300...1330 4th rack travel in: 1400 Speed

rpm : 0.30...1.40Speed

LOW IDLE 1 Control lever

position degrees: 32...40

Setting point w/out bumper spring

rpm : 415 Speed Rack travel in mm: 4.7

Testing:

: 100 Speed rpm Minimum rack trave: 19.00 Speed : 415 rpm

Rack travel in mm : 5.10...5.30

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1175

Rack travel in m: 10.40...10.50

rpm : 800 2nd speed

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 800

Del.quantity cm3/: 98.0...102.0 1000 s: (96.0...104.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.40

rpm : 1240...1250 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 145.0...165.0

1000 s: (140.0...170.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

rpm : 415 Speed

Rack travel in mm : 5.10...5.30 Del.quantity cm3/: 15.0...19.0 1000 s: (12.5...21.5)

Spread

cm3 : 6.00

1000 st (8.00)

Remarks:

: C.D.C # 3919459

Adjust stop lever to 0.5...1.0 mm

before stop.

Start-of-delivery mark 11° cam angle

after start of delivery cyl. 1

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in full-load delivery with torque-control

spring retainer.

L17

Note remarks

: CUM 8,3 L13 : 08.07.91 Test sheet Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 400 866 149

Injection pump

Pump designation : PES6A100D320/3RS2763

EP type number : 0 410 806 006

Governor

: RSV375...1000A0c2190 Governor design.

-44R

: 0 420 233 250 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6 CTA

: 166.0 1st version kW Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 12.90...13.00

Del.guantity cm3/: 13.2...13.4

100 s: (13.0...13.6)

Spread cm3 : 0.4

100 s: (0.6)

rpm : 375.0 2nd speed

Rack travel in mm: 5.3...5.5 Del.quantity cm3/: 1.4...1.8

100 s: (1.1...2.0)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

: 132.5...134.5 Del.quantity 1000 : (130.5...136.5)

: 4.00

Spread cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 37...45

Testing:

1st rack travel in: 11.90

rpm : 1050...1060 Speed

2nd rack travel in: 4.00

rpm : 1115...1145 Speed

3rd rack travel in: 4.00

Speed rpm : 1120...1150 4th rack travel in: 1200 Speed rpm : 0.30...1.40

LOW IDLE 1 Control lever

position degrees: 15...23

Setting point w/out bumper spring

rpm : 375 Rack travel in mm: 4.9

Testing:

rpm : 100 Speed

Minimum rack trave: 19.00

Speed rpm : 375 Rack travel in mm : 5.30...5.50

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1000 1st speed

Rack travel in m: 12.90...13.00

rpm : 750 2nd speed

Rack travel in m: 13.60...13.80

FUEL DELIVERY CHARACTERISTICS

1st version

rpm : 750 Speed

Del.quantity cm3/: 141.5...145.5 1000 s: (139.5...147.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.90

Speed rpm : 1050...1060

STARTING FUEL DELIVERY

LOW IDLE

Speed rpm : 375
Rack travel in mm : 5.30...5.50
Del.quantity cm3/ : 14.0...18.0

1000 s: (11.5...20.5)

Spread cm3 : 6.001000 s: (8.00)

Remarks:

: C.D.C # 3915570

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

Note remarks

: CUM 8,3 L 8 : 08.07.91 Test sheet Edition : 2.5.90

Replaces Test oil : ISO-4113

Combination no. : 0 400 866 150

Injection pump

Pump designation : PES6A100D320/3RS2763

EP type number : 0 410 806 006

Governor

: RSV400...1100A0C2190 Governor design.

-45R

: 0 420 233 253 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CT 8.3

: 134.0 1st version kW Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 017 assembly

Opening 1

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Lenath mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 : (2.75...2.95) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 10.90...11.00

Del.guantity cm3/: 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 375.0

Rack travel in mm: 5.9...6.1
Del.quantity cm3/: 2.3...2.7

100 s: (2.0...2.9)

cm3 : 0.6Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed : 1100 man

101.5...103.5 1000 : (99.5...105.5) Del.quantity

: 4.00 Spread cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 51...59

Testing:

1st rack travel in: 9.90

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1230...1240 Speed

3rd rack travel in: 4.00

Speed rpm : 1230...1260 4th rack travel in: 1300

Speed rpm : 0.30...1.40

LOW IDLE 1 Control Lever

position degrees: 31...39

Setting point w/out bumper spring

rpm : 37 Speed Rack travel in mm : 5.5

Testing:

Speed : 100 man Minimum rack trave: 19.00 : 375 rpm

Rack travel in mm : 5.90...6.10

TORQUE CONTROL

Torque control curve - 1st version

1st speed

st speed rpm : 1100
Rack travel in m: 10.90...11.00
and speed rpm : 750

2nd speed

Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750 Del.quantity cm3/ : 114.5...118.5 1000 s: (112.5...120.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.90

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

LOW IDLE

rpm : 375 Speed

Rack travel in mm: 5.90...6.10 Del.quantity cm3/: 23.0...27.0 1000 s: (20.5...29.5)

cm3 : 6.00Spread

1000 s: (8.00)

Remarks:

: C.D.C. # 3915974

Adjust stop lever to 0.5...1.0 mm

before stop.

Start-of-delivery mark 11° cam angle

after start of delivery cyl. 1

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control

spring retainer.

L21

Note remarks

: CUM 8,3 p : 08.07.91 Test sheet Edition : 13.5.91 Replaces : ISO-4113 Test oil

Combination no. : 0 400 866 153

Injection pump

Pump designation : PES6A100D320/3RS2763

EP type number : 0 410 806 006

Governor

Governor design. : RSV400...950A0C2238-

1R

: 0 420 233 255 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CT 8.3

1st version kW : 145.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening |

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 27...29

: 2.80...2.90 Prestroke mm : (2.75...2.95) Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 950

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 12.0...12.2

100 s: (11.8...12.4)

Spread cm3 : 0.4

100 s: (0.6)

rpm : 400.02nd speed Rack travel in mm: 5.2...5.4

Del.quantity cm3/: 1.3...1.7

100 s: (1.0...1.9)

cm3 : 0.6Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 950 Speed Aneroid pressure h: 900

: 120.5...122.5 Del.quantity 1000 : (118.5...124.5)

cm3 : 4.00 Spread

1000 : (6.50)

RATED SPEED

1st version Control Lever

position degrees: 37...45

Testing: 1st rack travel in: 11.10 rpm : 990...1000 Speed 2nd rack travel in: 4.00 Speed rpm : 1065...1075 3rd rack travel in: 4.00 Speed rpm : 1070...1100 4th rack travel in: 1150 rpm : 0.30...1.40

Speed

LOW IDLE 1 Control lever position degrees: 17...25 Setting point w/out bumper spring Speed rpm : 400

Rack travel in mm: 4.8

Testing: Speed rpm : 100 Minimum rack trave: 19.00 Speed

: 400 rpm Rack travel in mm : 5.20...5.40

Aneroid/Altitude Compensator Test

1st version Setting rpm : 500 hPa : 900 Speed rpm Pressure

: 12.10...12.20 Rack travel mm

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.60...10.80 2nd pressure hPa : 220 Rack travel in m: 11.10...11.20 3rd pressure hPa : 305 Rack travel in m: 11.40...11.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500
Del.quantity cm3/: 89.5...93.5
1000 s: (87.5...95.5)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.10 rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 150.0...170.0 1000 s: (145.0...175.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

: 400 Speed rpm

Rack travel in mm : 5.20...5.40 Del.quantity cm3/: 13.0...17.0 1000 s: (10.5...19.5)

cm3 : 6.00 Spread 1000 s: (8.00)

Remarks:

: C.D.C # 3917577

Adjust stop Lever to 0.5...1.0 mm before stop.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

L23

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Note remarks Rack travel in mm : 10.50 : CUM 8,3 a77 : 08.07.91 Firing order Test sheet Edition : 10.4.91 Replaces Test oil : ISO-4113 Phasing Combination no. : 0 400 866 160 Tolerance + - ° Injection pump Pump designation : PES6A100D320/3RS2691 Time to cyl. no. : 9 410 230 025 EP type number BASIC SETTING Governor : RSV470...1100A0C2190 Governor design. -48R 1st speed rpm: 1100 : 0 420 233 262 Governer no. Rack travel in mm : 12.10...12.20 Customer-spec. information Del.quantity cm3/: 11.5...11.7 Customer : C.D.C. 100 s: (11.3...11.9) Engine : 6CT830 : 150.6 : 2200 cm3 : 0.41st version kW Spread Rated speed 100 s: (0.6) TEST BENCH REQUIREMENTS rpm : 470.0 2nd speed Rack travel in mm: 5.7...5.9 Test oil Del.quantity cm3/ : 1.6...2.0 inlet temp. °C : 38...42 100 s: (1.4...2.3) Overflow valve cm3 : 0.6Spread : 1 417 413 047 100 s: (0.8) GUIDE SLEEVE POSITION Inlet press., bar: 1.50 Control-lever position Test nozzle holder Degree: -3 : 1 688 901 101 rpm : 800 assembly Speed Rack travel in mm : 0.30...0.70 **Opening** : 207...210 Governor spring pre-tension pressure, bar Click setting x : 4.00 Orifice plate FULL LOAD DELIV. AT FULL LOAD STOP diameter mm : 0,6 1st version : 1 680 750 014 Test lines Speed Del.quantity Outside diameter x Wall thickness Spread : 6.00X2.00X600 x Length mm RATED SPEED (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. 1st version Control lever per values BEGINNING OF DELIVERY

rpm : 1100 : 115.0...117.0 1000 : (113.0...119.0) cm3 : 4.001000 : (6.50) position degrees: 48...56 Testina:

: 2.80...2.90 : (2.75...2.95)

: 0.50 (0.75)

: 1-5-3-6-2-4

: 0-60-120-180-240-300

Test pressure, bar: 27...29

1st rack travel in: 11.10 rpm : 1160...1170 Speed 2nd rack travel in: 4.00 rpm : 1235...1245 Speed 3rd rack travel in: 4.00 rpm : 1235...1265

4th rack travel in: 1325 rpm : 0.30...1.40Speed

LOW IDLE 1 Control lever

position degrees: 26...34 Setting point w/out bumper spring

Speed rpm : 470 Rack travel in mm: 5.3

Testina:

Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 470 Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 12.10...12.20

: 750 2nd speed rpm

Rack travel in m: 13.00...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 750 Del.quantity cm3/ : 128.0...132.0 1000 s: (126.0...134.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.10 rpm : 1160...1170 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...155.0

1000 s: (130.0...160.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 470 Rack travel in mm : 5.70...5.90 Del.quantity cm3/ : 16.5...20.5 1000 s: (14.0...23.0)

cm3 : 6.00Spread 1000 s: (8.00)

Remarks:

: C.D.C. # 3917962

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Adjust stop lever to 0.5...1.0 mm before stop.

Note remarks

: CUM 8,3 a83 : 08.07.91 Test sheet Edition Replaces : 5.10.90

Test oil : ISO-4113

Combination no. : 0 400 866 167

Injection pump

Pump designation : PES6A100D320/3RS2691

: 9 410 230 025 EP type number

Governor

: RSV400...1100A0c2190 Governor design.

-50R

: 0 420 233 276 Governer no.

Customer—spec. information Customer : C.D.C.

Engine : 6 CT 8.3

: 138.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

: 1 680 750 014 Test lines

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

rrestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 10.50 Firing order

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 11.40...11.50

Del.quantity cm3/: 10.9...11.1

100 s: (10.7...11.3)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 400.0 2nd speed

Rack travel in mm: 5.7...5.9 Del.quantity cm3/: 1.7...2.1

100 s: (1.4...2.3)

cm3 : 0.6 Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 109.5...111.5 : (107.5...113.5) Del.quantity 1000

: 4.00 cm3

1000 : (6.50)

RATED SPEED

Spread

1st version

Control lever

position degrees: 48...56

Testing:

1st rack travel in: 10.40

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm: 1215...1245 4th rack travel in: 1300

rpm : 0.30...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 27...35

Setting point w/out bumper spring

rpm Rack travel in mm: 5.3

Testing:

Speed rpm: 100 Minimum rack trave: 19.00 rpm : 400

Rack travel in mm : 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 11.40...11.50

2nd speed rpm : 750

Rack travel in m: 12.60...12.80

FUEL DELIVERY CHARACTERISTICS

1st version

: 750 Speed man

Del.quantity cm3/: 127.5...131.5 1000 s: (125.5...133.5)

**BRFAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 140.0...160.0

1000 s: (135.0...165.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm: 400
Rack travel in mm: 5.70...5.90
Del.quantity cm3/: 17.0...21.0

1000 s: (14.5...23.5)

cm3 : 6.00Spread

1000 s: (8.00)

Remarks:

: C.D.C # 3919497

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

L27

Note remarks

: CUM 8,3 a84 Test sheet E. tion : 08.07.91 : 18.2.91 Replaces

Test oil : ISO-4113

Combination no. : 0 400 866 168

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

Governor design. : RSV400...1100A0C2190

-52R

: 0 420 233 278 Governer no.

Cust. part no. : 3917456

Customer-spec. information Customer : C.D.C.

: 6 CTA 8.3ltr Engine

: 174.5 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 asserbly

Coening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal dalivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm

: 2.80...2.90 : (2.75...2.95)

Rack travel in mm: 10.50

: 1-5-3-6-2-4 Firina order

: 0-60-120-180-240-300 Fhasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

rpm: 1100 1st speed

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.7...12.9

100 s: (12.5...13.1)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm: 5.8...6.0

Del.quantity cm3/: 1.7...2.1 100 s: (1.4...2.3)

cm3 : 0.6Spread

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 127.0...129.0 Del.quantity

1000 : (125.0...131.0)

cm3 : 4.00 Spread

1000 : (6.50)

RATED SPEED

1st version Control lever

position degrees: 39...47

Testina: 1st rack travel in: 11.70 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 Speed rpm : 1210...1220 3rd rack travel in: 4.00 Speed rpm : 1210...1240 4th rack travel in: 1300 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 17...25 Setting point w/out bumper spring : 400 rpm Rack travel in mm: 5.4 Testing: Speed : 100 rpm Minimum rack trave: 19.00 rpm : 400 Speed Rack travet in mm : 5.80...6.00 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.70 Speed rpm : 1140...1150 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 155.0...175.0 1000 s: (150.0...180.0) Rack travel in mm: 16.20...16.40 LOW IDLE : 400 Speed rpm Rack travel in mm : 5.80...6.00 Del.quantity cm3/: 17.0...21.0 1000 s: (14.5...23.5) Spread cm3 : 6.001000 s: (8.00) Remarks: : C.D.C # 3917456

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

Test sheet

: CUM 8,3 a96

Edition

: 08.07.91

Replaces

Test oil

: ISO-4113

Combination no.

: 0 400 866 170

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number

: 9 410 230 025

Governor

Governor design.

: RSV400...1100A0c2190

-53R

Governer no.

: 0 420 233 284

Customer

Customer-spec. information : C.D.C.

Engine

: 6 CT 8.3ltr

1st version kW

: 173.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening |

pressure, bar

: 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 10.50

Firing order

Prestroke mm

: 1-5-3-6-2-4

Phasina

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 10.70...10.80

Del.quantity cm3/: 9.8...10.0

100 s: (9.6...10.2)

cm3 : 0.4

100 s: (0.6)

rpm : 425.0 2nd speed

Rack travel in mm: 5.3...5.5

Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2)

Spread

Spread

cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 Speed

rom : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

: 98.0...100.0 Del.quantity

1000 : (96.0...102.0)

Spread cm3

: 4.00

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 43...51

Testing:

MO2

1st rack travel in: 9.70 rpm : 1170...1180 Speed 2nd rack travel in: 4.00 rpm : 1235...1245 Speed 3rd rack travel in: 4.00 rpm : 1230...1260 Speed 4th rack travel in: 1300 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever position degrees: 25...33 Setting point w/out bumper spring Speed rpm : 425 Rack travel in mm : 4.9 Testing: : 100 Speed rpm Minimum rack trave: 19.00 Speed rpm : 425 Rack travel in mm : 5.30...5.50 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.70 rpm : 1170...1180 Speed STARTING FUEL DELIVERY Speed : 100 rom Del.quantity cm3/: 135.0...155.0 1000 s: (130.0...160.0) Rack travel in mm: 19.00...21.00 LOW IDLE rpm : 425 Speed Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5) cm3 : 6.00Spread 1000 s: (8.00) Remarks: : C.D.C # 3919767 Adjust stop lever to 0.5...1.0 mm

before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

POSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : CUM 8,3 a93 : 08.07.91 Test sheet Edition : 13.5.91 Replaces Test oil : ISO-4113 : 0 400 866 171 Combination no. Injection pump Pump designation : PES6A100D320/3RS2691 EP type number : 9 410 230 025 Governor : RSV400...1050A0c2190 Governor design. -54R : 0 420 233 285 Governer no. Customer-spec. information : C.D.C Customer : 6 CT 8.3 Engine : 154.4 1st version kW : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 047 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,6 Test lines : 1 680 750 014

: 6.00X2.00X600

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

: 2.80...2.90 : (2.75...2.95) Prestroke mm Rack travel in mm : 10.50 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. BASIC SETTING rpm: 1050 1st speed Rack travel in mm : 12.40...12.50 Del.quantity cm3/: 12.5...12.7 100 s: (12.3...12.9) Spread cm3 : 0.4100 s: (0.6) rpm : 400.02nd speed Rack travel in mm : 5.5...5.7 Del.quantity cm3/ : 1.5...1.9 100 s: (1.3...2.2) Spread cm3 : 0.6100 s: (0.8) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 4.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1050 Speed . 125.5...127.5 1000 : (123.5...129.5) Del.quantity : 4.00 Spread cm3 1000 : (6.50) RATED SPEED 1st version Control lever position degrees: 38...46 Testing:

Outside diameter

x Wall thickness

per values \_\_

BEGINNING OF DELIVERY
Test pressure, bar: 27...29

x Length mm

1st rack travel in: 11.40 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1130...1160 Speed 3rd rack travel in: 4.00 rpm : 1135...1165 Speed 4th rack travel in: 1275 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever position degrees: 19...27 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.1 Testing: : 100 Speed rpm Minimum rack trave: 19.00 rpm : 400 Speed Rack travel in mm : 5.50...5.70 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.40 rpm : 1090...1100 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 145.0...165.0 1000 s: (140.0...170.0) Rack travel in mm : 19.00...21.00 LOW IDLE Speed rpm : 400 Rack travel in mm : 5.50...5.70 Del.quantity cm3/ : 15.5...19.5 1000 s: (13.0...22.0) cm3 : 6.00Spread 1000 s: (8.00) Remarks: : C.D.C # 3919768 Adjust stop lever to 0.5...1.0 mm before stop. Start-of-delivery mark at 10° cam rotation angle after start of delivery,

cylinder 1

Note remarks

: CUM 8,3 a94 Test sheet Edition : 08.07.91 Replaces : 13.5.91 Test oil : ISO-4113

: 0 400 866 172 Combination no.

Injection pump

Pump designation : PES6A100D320/3RS2691

EP type number : 9 410 230 025

Governor

Governor design. : RSV400...1250A0c2190

-55R

: 0 420 233 286 Governer no.

Customer-spec. information : C.D.C. Customer

: 6 CTA 8.3 Enaine

1st version kW : 131.0 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasina

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 10.90...11.00

Del.guantity cm3/: 10.3...10.5

100 s: (10.1...10.7)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 400.02nd speed Rack travel in mm: 5.2...5.4 Del.quantity cm3/: 1.2...1.6

100 s: (1.0...1.9)

cm3 : 0.6 Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1250 Speed

: 103.5...105.5 Del.quantity 1000 : (101.5...107.5)

cm3 : 4.00Spread

1000 : (6.50)

RATED SPEED

1st version

Control Lever

position degrees: 51...59

Testing:

M06

1st rack travel in: 9.90 rpm : 1290...1300 Speed 2nd rack travel in: 4.00 Speed rpm : 1360...1390 4th rack travel in: 1450 Speed rpm : 0.30...1.40 LOW IDLE 1 Control Lever position degrees: 26...34 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 4.8 Testing: Speed rpm: 100
Minimum rack trave: 19.00
Speed rpm: 400
Rack travel in mm: 5.20...5.40 **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.90 rpm : 1290...1300 Speed STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 145.0...165.0 1000 s: (140.0...170.0) Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400
Rack travel in mm : 5.20...5.40
Del.quantity cm3/: 12.5...16.5
1000 s: (10.0...19.5)
Spread cm3 : 6.00

Spread cm3 : 6.00 1000 s: (8.00)

Remarks:

: C.D.C # 3920811

Adjust stop lever to 0.5...1.0 mm before stop.

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

Note remarks

: LIE 5,6 a 9 : 26.07.91 Test sheet Edition : 31.7.90 Replaces : ISO-4113 Test oil

Combination no. : 0 400 874 2380

Injection pump

Pump designation : PES4A95D410RS2685 EP type number : 0 410 894 996

Governor

Governor design. : RSV400...1000A1C2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D904 T Engine

: 100.0 1st version kW : 2000 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening .

pressure, bar : 172...175

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

: 1-3-4-2 Firing order

: 0-90-180-270 Phasing

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00

Difference ° CS : 4.00...5.00

BASIC SETTING

rpm: 990 1st speed

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 13.7...13.9

100 s: (13.5...14.1)

cm3 : 0.3Spread

100 s: (0.6)

rpm : 415.0 2nd speed Rack travel in mm: 6.3...6.5

Del.quantity cm3/: 1.1...1.7

100 s: (0.8...1.9) cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

: 990 Speed rpm

: 137.0...139.0 Del.quantity 1000 : (135.0...141.0)

: 3.50

Spread cm3 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 93...101

**MO8** 

Testing: 1st rack travel in: 13.20 Speed rpm : 1030...1040 2nd rack travel in: 4.00 Speed rpm : 1060...1090 4th rack travel in: 1225 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 67...75 Setting point w/out bumper spring Speed rom : 415 Rack travel in mm: 5.9 Testing: rpm : 100 Speed Minimum rack trave: 19.50 rpm : 415 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 rpm : 410...470 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 990 Rack travel in m: 14.20...14.30 2nd speed rpm : 500 Rack travel in m: 14.20...14.40 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 129.5...132.5 1000 s: (127.0...135.0) Speed rpm : 750 Del.quantity cm3/: 134.0...137.0 1000 s: (131.5...139.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 1030...1040 Speed STARTING FUEL DELIVERY 

Remarks:

M<sub>0</sub>9

LOW IDLE

Note remarks

: LIE 5,6 a11 : 26.07.91 : 31.7.90 Test sheet Edition Replaces

: ISO-4113 Test oil

: 0 400 874 238L Combination no.

Injection pump

Pump designation : PES4A95D41ORS2685 : 0 410 894 996 EP type number

Governor

Governor design. : RSV400...1000A1c2187

: 0 420 232 387 Governer no.

Customer-spec. information Customer : LIEBHERR

: D904 T Engine

1st version kW : 100.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 40...45

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.70...2.80 Prestroke mm

: (2.65...2.85)

Firing order

: 0-90-180-270 Phasing

Rack travel in mm : 9.00...12.00

: 1-3-4-2

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 8.50...9.50

& maximum rack tra: 21.00 Difference ° CS : 4.00...5.00

BASIC SETTING

rpm: 990 1st speed

Rack travel in mm : 14.20...14.30

Del.guantity cm3/: 13.7...13.9

100 s: (13.5...14.1)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 415.0 2nd speed Rack travel in mm: 6.3...6.5

Del.quantity cm3/: 1.1...1.7 100 s: (0.8...1.9)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 2.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 990

: 137.0...139.0 Del.quantity 1000 : (135.0...141.0)

: 3.50 cm3 Spread : (6.00) 1000

RATED SPEED

1st version Control Lever

position degrees: 89...97

Testing: 1st rack travel in: 13.20 rpm : 1030...1040 Speed 2nd rack travel in: 4.00 Speed rpm : 1045...1075 3rd rack travel in: 4.00 Speed rpm : 1075...1105 4th rack travel in: 1245 rpm : 0.30...1.40 Speed LOW IDLE 1 Control lever position degrees: 63...71 Setting point w/out bumper spring Speed rpm: 415 Rack travel in mm: 5.9 Testing: Speed rpm : 100 Minimum rack trave: 19.50 rpm : 415 Speed Rack travel in mm : 6.30...6.50 Rack travel in mm : 2.00 : 525...585 Speed rom TORQUE CONTROL Torque control curve - 1st version rpm : 990 1st speed Rack travel in m: 14.20...14.30 2nd speed rpm : 500 Rack travel in m: 14.20...14.40 FUEL DELIVERY CHARACTERISTICS 1st version Del.quantity cm3/: 134.0...137.0 1000 s: (131.5...139.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 1030...1040 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 120.0...130.0 1000 s: (117.0...133.0) Rack travel in mm: 19.50...21.00

LOW IDLE

Speed rpm : 415 Rack travel in mm : 6.30...6.50 Del.quantity cm3/: 11.0...17.0 1000 s: (8.5...19.5) Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

911

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 27...29 Note remarks Prestroke mm : 2.95...3.05 : (2.90...3.10) Rack travel in mm : 10.50 Firing order : 1-5-3-6-2-4 : DEE 7,7 d 6 : 18.06.91 : 19.3.91 Test sheet Edition Replaces : ISO-4113 Test oil : 0 400 876 383 Combination no. Injection pump : 0-60-120-180-240-300 Phasing Pump designation : PES6A100D410RS2762-1 Tolerance + - ° EP type number : 0 410 806 008 : 0.50 (0.75) Governor : RSV400...1100A2C2204 Time to cyl. no. : 1 Governor design. : 0 420 232 551 BASIC SETTING Governer no. 1st speed rpm: 1100 Customer-spec. information : JOHN DEERE Customer Rack travel in mm : 10.70...10.80 : 6076TDW02 Engine Del.guantity cm3/: 10.0...10.2 1st version kW : 128.0 : 2200 100 s: (9.8...10.4) Rated speed cm3 : 0.4TEST BENCH REQUIREMENTS Spread Test oil 100 s: (0.6) inlet temp. °C : 38...42 rpm : 400.02nd speed Rack travel in mm: 5.8...6.0 Overflow valve Del.quantity cm3/: 2.9...3.3 : 1 457 413 010 100 s: (2.7...3.5) Inlet press., bar: 1.50 Spread cm3 : 0.6100 s: (0.8) **Overflow** quantity min. 1/h: 190...200 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -3 : 1 688 901 101 rpm : 800 assembly Rack travel in mm : 0.30...0.70 Opening Governor spring pre-tension : 207...210 pressure, bar Click setting x : 5.00Orifice plate FULL LOAD DELIV. AT FULL LOAD STOP diameter mm : 0,6 1st version : 1 680 750 008 rpm : 1100 Test lines Speed 100.5...102.5 1000 : (98.5...104.5) Del.quantity Outside diameter : 4.00 x Wall thickness Spread cm3 : 6.00X2.00X600 1000 : (6.50) x Length mm

RATED SPEED

1st version

(A) Injection pump setting values

per values \_\_\_

Insp. values in parentheses Set equal delivery quant. Control lever

position degrees: 40...48

Testing:

1st rack travel in: 9.70

rpm : 1150...1160 Speed

2nd rack travel in: 4.00

rpm : 1195...1205 Speed

3rd rack travel in: 4.00

rpm : 1195...1225 Speed

4th rack travel in: 1300 Speed rpm: 0.30...1.40

LOW IDLE 1

Control lever

position degrees: 15...23

Setting point w/out bumper spring

rpm : 400

Rack travel in mm: 5.4

Testing:

rpm : 100 Speed

Minimum rack trave: 19.00

Speed rpm: 400

Rack travel in mm : 5.80...6.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed

st speed rpm : 1100
Rack travel in m: 10.70...10.80

2nd speed rpm : 700

Rack travel in m: 12.60...12.80

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700 Del.quantity cm3/ : 131.5...135.5 1000 s: (129.5...137.5)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 9.70

rpm : 1150...1160 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

Speed

rom

: 400

M13

Rack travel in mm : 5.80...6.00 Del.quantity cm3/ : 29.0...33.0 1000 s: (27.0...35.0)

cm3 : 6.00 Spread 1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47356

Start-of-delivery mark = 13,5° after

start of delivery cyl. 1.

Starting/full-load transition speed from holding magnet = 450 1/min.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control

spring retainer.

Note remarks

: MB 6,0 j 3 : 26.07.91 Test sheet Edition : 18.2.91 Replaces : ISO-4113 Test oil

Combination no. : 0 400 876 388

Injection pump

Pump designation : PES6A95D410RS2797 : 0 410 896 900 EP type number

Governor

Governor design. : RSV350...1200A1C1154

-2L

: 0 420 232 561 Governer no.

Customer-spec. information

: MERCEDES-BENZ Customer

: OM 366 Engine

: 81.0 1st version kW : 2400 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 000

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 3.20...3.30 : (3.15...3.35) Prestroke mm

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

rpm: 1200 1st speed

Rack travel in mm : 9.80...9.90

Del.quantity cm3/: 5.4...5.6

100 s: (5.2...5.8)

cm3 : 0.3Spread

100 s: (0.6)

2nd speed rpm : 350.0 Rack travel in mm : 9.4...10.0 Del.quantity cm3/ : 0.8...1.4

100 s: (0.5...1.6) cm3 : 0.3

Spread 100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1200 Speed

: 54.5...56.5 Del.quantity 1000 : (52.5...58.5)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 108...116

Testing:

1st rack travel in: 8.80

rpm : 1240...1245 Speed

2nd rack travel in: 4.00

rpm : 1263...1280 Speed

3rd rack travel in: 4.00

rpm : 1300...1330 Speed 4th rack travel in: 1400 rpm : 0.30...1.40Speed 5th rack travel in: 1255...1265 Speed rpm : 8.80 LOW IDLE 1 Control lever position degrees: -3 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 9.70 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 350
Rack travel in mm : 9.40...10.00
Rack travel in mm : 2.00 rpm : 495...555 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 9.80...9.90 2nd speed rpm : 500 Rack travel in m: 11.10...11.30 3rd speed rpm : 850 Rack travel in m: 10.40...10.60 FUEL DELIVERY CHARACTERISTICS 1st version rpm : 500 Speed Del.quantity cm3/: 48.0...51.0 1000 s: (45.5...53.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 8.80 rpm : 1240...1245 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 92.0...102.0 1000 s: (89.0...105.0) Rack travel in mm : 16.10...16.50 Remarks: **APPLICATION** 

Unimog

M15

Note remarks

Test sheet : DEE 7,7 d 7 : 18.06.91 Edition

Replaces

: ISO-4113 Test oil

Combination no. : 0 400 876 391

Injection pump

Pump designation : PES6A100D410RS2762-1

: 0 410 806 008 EP type number

Governor

: RSV425...1100A2C2225 Governor design.

-5L

: 0 420 232 566 Governer no.

Customer—spec. information

Customer : JOHN DEFRE

: 6076ARW-09 Engine

: 145.0 1st version kW : 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening .

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

: 2.95...3.05 : (2.90...3.10) Prestroke mm

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ 

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 11.80...11.90

Del.guantity cm3/: 11.4...11.6

100 s: (11.2...11.8)

cm3 : 0.4Spread

100 s: (0.6)

rpm : 425.0 2nd speed

Rack travel in mm : 5.7...5.9 Del.quantity cm3/ : 2.6...3.0

100 s: (2.4...3.2) cm3: 0.6

Spread 100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800

Speed Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed Aneroid pressure h: 900

: 114.0...116.0 Del.quantity

1000 : (112.0...118.0)

: 4.00 cm3 Spread

1000 : (6.50)

RATED SPEED

1st version Control lever

position degrees: 40...48

M16

Testing:

1st rack travel in: 10.80

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1205...1215 Speed

4th rack travel in: 1300

rpm : 0.30...1.40Speed

LOW IDLE 1 Control lever

position degrees: 17...25

Setting point w/out bumper spring

rpm : 425

Rack travel in mm: 5.3

Testing:

rpm : 100 Speed

Minimum rack trave: 19.00

Speed rpm: 425 Rack travel in mm: 5.70...5.90

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100 Rack travel in m: 11.80...11.90

2nd speed

nd speed rpm : 650 Rack travel in m: 13.70...13.90

Aneroid/Altitude

Compensator Test

1st version Setting

Speed : 500 rpm

hPa : 900 Pressure

Rack travel mm : 13.70...13.90

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90
2nd pressure hPa : 535
Rack travel in m: 12.30...12.40
3rd pressure hPa : 720
Rack travel in m: 13.30...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 650 Speed

Del.quantity cm3/: 147.5...150.5 1000 s: (145.0...153.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 129.0...133.0 1000 s: (126.0...136.0)

1st version

**BREAKAWAY** 

1mm rack travel less than

full load rack tr: 10.80

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

Speed rpm : 425
Rack travel in mm : 5.70...5.90
Del.quantity cm3/ : 26.0...30.0
1000 s: (24.0...32.0)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47502

Starting/full-load transition speed from holding magnet = 450 1/min.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Start-of-delivery mark = 13,5° after start of delivery cyl. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : STE 12,0 h : 05.07.91 Edition : 1.2.91 Replaces : ISO-4113 Test oil Combination no. : 0 401 838 709 Injection pump Pump designation : PE8P110A120LS3271 : 0 411 818 723 EP type number Governor Governor design. : RQV250...1100PA951-2 Governer no. : 0 421 813 908 Customer-spec. information Customer Engine : WD815.66 : 270.0 1st version kW : 2200 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening | pressure, bar : 172...175 Test lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 2.80...2.90

Rack travel in mm : 9.00...12.00

: (2.75...2.95)

: 1- 5- 4- 8- 6- 3-7- 2 : 0-45-90-135-180-225-Phasing 270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 1100 1st speed Rack travel in mm : 13.40...13.50 Del.quantity cm3/: 17.4...17.6 100 s: (17.1...17.9) cm3 : 0.4Spread 100 s: (0.7) 2nd speed rpm : 250.0 Rack travel in mm: 4.1...4.3 Del.quantity cm3/: 1.7...2.3 100 s: (1.5...2.5) cm3 : 0.4Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 : 0.90...1.30 travel mm rpm : 485 2nd speed : 3.20...3.80 travel mm 3rd speed rpm : 640 : 4.20...4.80 travel mm 4th speed rpm : 1145 : 8.40...8.60 travel mm rpm : 1220 5th speed : 9.80...10.20 travel mm GUIDE SLEEVE POSITION Control-Lever position Degree: -1 rpm : 1130 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100 Speed Aneroid pressure h: 1200 Del.quantity : 174.0...176.0 1000 : (171.0...179.0)

Firing order

Prestroke mm

cm3 : 4.00 1000 : (7.50) Spread RATED SPEED 1st version Control lever position degrees: 114...122 Testing: 1st rack travel in: 12.40 Speed rpm : 1140...1150 2nd rack travel in: 4.00 rpm : 1210...1240 Speed 4th rack travel in: 1350 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: ? Setting point w/out bumper spring Speed rpm : 250 Rack travel in mm : 4.2 Testing: Speed rpm : 100 Minimum rack trave: 4.60 rpm : 250 Rack travel in mm : 4.10...4.30 CONSTANT REGULATION rpm : 250...390 Speed TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1100
Rack travel in m: 13.40...13.50 1st speed : 600 2nd speed rpm Rack travel in m: 13.40...13.60 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 hPa : 1200 Speed rpm Pressure Rack travel mm : 13.40...13.50 Measurement 1/min: 500 Speed

Rack travel in m: 9.90...10.10 Rack travel in m: 12.50...12.60 Rack travel in m: 10.80...11.00

START CUT-OUT 1/min: 170 (190) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 600 Speed Del.quantity cm3/: 186.0...190.0 1000 s: (183.0...193.0) Aneroid pressure h: -Speed rpm\_ : 500 Del.quantity cm3/: 117.0...119.0 1000 s: (114.0...122.0) **BRFAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.40 rpm : 1140...1150 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 220.0...260.0 1000 s: (216.0...264.0) Rack travel in mm : 20.00...21.00 Remarks: Delivery-valve spring pre-tension = 1.80...2.00 mm. Permissible alteration from 1.60...2.30

1st pressure hPa : -

2nd pressure hPa : 600

3rd pressure hPa : 380

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : STE 12.0 i : 05.07.91 Test sheet Edition : 1.2.91 Replaces : ISO-4113 Test oil Combination no. : 0 401 838 710 Injection pump Pump designation : PE8P110A120LS3271 : 0 411 818 723 EP type number Governor Governor design. : RQ300/1100PA958-2 : 0 421 801 570 Governer no. Customer—spec. information Customer : SNF Engine : WD815.66 1st version kW : 270.0 Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening : 172...175 pressure, bar : 1 680 750 015 Test lines Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 2.80...2.90 Prestroke mm : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1- 5- 4- 8- 6- 3-7- 2 Firing order : 0-45-90-135-180-225-Phasing 270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 1100 1st speed Rack travel in mm : 13.40...13.50 Del.guantity cm3/: 17.4...17.6 100 s: (17.1...17.9) Spread cm3 : 0.4100 s: (0.7) rpm : 300.02nd speed Rack travel in mm: 4.1...4.3 Del.quantity cm3/: 1.7...2.3 100 s: (1.5...2.5) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 600 Speed Rack travel in mm : 15.60...16.40 FULL GOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100 Speed Aneroid pressure h: 1200 : 174.0...176.0 Del.quantity 1000 : (171.0...179.0) cm3 : 4.00 Spread 1000 : (7.50) RATED SPEED 1st version Setting point: Speed man Rack travel in mm: 16.0 Testing: 1st rack travel in: 12.40 rpm : 1145...1160 Speed 2nd rack travel in: 4.00

Speed rpm : 1200...1230 4th rack travel in: 1350

rpm : 0.00...1.40Speed

LOW IDLE 1

Setting point w/out bumper spring

' rpm : 300 Rack travel in mm: 4.2

Testing:

Speed rpm : 100 Minimum rack trave: 5.70

Speed rpm: 300 Rack travel in mm: 4.10...4.30

Rack travel in mm : 2.00

Speed : 340...380 rom

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 1100 1st speed

Rack travel in m: 13.40...13.50 2nd speed rpm : 600 Rack travel in m: 13.40...13.60

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rom Pressure hPa : 1200

: 13.40...13.50 Rack travel mm

Measurement

Speed  $1/\min : 500$ 

1st pressure hPa : -

Rack travel in m: 9.90...10.10

2nd pressure hPa : 600

Rack travel in m: 12.50...12.60

3rd pressure hPa : 380

Rack travel in m: 10.80...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed rpm : 600

Del.quantity cm3/: 186.0...190.0

1000 s: (183.0...193.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 117.0...119.0 1000 s: (114.0...122.0)

BREAKAWAY

M21

1st version

1mm rack travel less than

full load rack tr: 12.40

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Remarks:

Delivery-valve spring pre-tension = 1.80...2.00 mm.

Permissible alteration from 1.60...2.30

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : STE 9,7 f Test sheet : 02.08.91 Edition : 19.5.88 Replaces Test oil : ISO-4113 Combination no. : 0 401 846 555 Injection pump Pump designation : PE6P110A720RS516 : 0 411 816 176 EP type number Governor Governor design. : RQV250...1100PA413-3 Governor no. : 0 421 813 695 Customer-spec. information Customer : STEYR : WD615.64 Engine : 175.0 1st version kW Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Openina pressure, bar : 172...175 Test Lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 0-60-120-180-240-300 Phasing Tolerance  $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING rpm: 1100 1st speed Rack travel in mm : 14.40...14.50 Del.quantity cm3/: 14.2...14.4 100 s: (13.9...14.7) cm3 : 0.4Spread 100 s: (0.7) rpm : 250.0 2nd speed Rack travel in mm: 6.4...6.6 Del.quantity cm3/: 1.9...2.4 100 s: (1.6...2.6) cm3 : 0.4 Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 250 1st speed : 0.90,..1.30 travel mm rpm : 350 2nd speed : 1.70...2.30 travel mm 3rd speed rpm : 650 : 4.00...4.60 travel mm rpm : 1150 4th speed : 8.40...8.60 travel mm rpm : 1250 5th speed : 9.60...10.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1175 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Aneroid pressure h: 900 Del.quantity : 142.0...147.0)

: 1-5-3-6-2-4

Firing order

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 2.80...2.90 : (2.75...2.95) Spread cm3 : 4.00 1000 : (7.50)

RATED SPEED

1st version Control Lever

position degrees: 104...112

Testina:

1st rack travel in: 13.40 rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1255...1285

4th rack travel in: 1400

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 69...77

Testina:

rpm : 100 Speed Minimum rack trave: 8.00 rpm : 250

Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

rpm : 250...370 Speed

TORQUE CONTROL

Dimension a mm : 0.80

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 14.40...14.50

2nd speed rpm : 860

Rack travel in m: 15.20...15.40

3rd speed rpm : 1000

Rack travel in m: 14.70...14.90

4th speed rpm : 700

Rack travel in m: 15.60...15.80

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 500 hPä : 900 Speed rpm Pressure

Rack travel mm : 15.60...15.80

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 13.30...13.50 2nd pressure hPa : 575 Rack travel in m: 15.00...15.10

3rd pressure hPa : 270

START CUT-OUT

Rack travel in m: 13.60...13.80

1/min: 170 (190) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm : 700

Del.quantity cm3/: 160.0...164.0

1000 s: (157.0,...167.0)

Aneroid pressure h: -

Speed rpm: 500
Del.quantity cm3/: 116.0...118.0
1000 s: (113.0...121.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 13.40

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 175.0...195.0

1000 s: (171.0...199.0)

Rack travel in mm : 16.50...17.50

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration; from 2.20...2.90

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: DAF 11,7 m : 21.06.91 Test sheet Edition : 14.12.90 Replaces : ISO-4113 Test oil

: 0 401 846 566 Combination no.

Injection pump

Pump designation : PE6P110A320RS526 EP type number : 0 411 816 178

Governor

Governor design. : RQ275/1000PA818-3 : 0 421 801 534 Governer no.

Customer-spec. information Customer

Engine : LT 160 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening |

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X1.50X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 13.00...14.00 Firing order : 1-5-3-6-

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 13.0...14.0 Difference ° CS : 2.00...4.00

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.20...14.30

Del.quantity cm3/: 15.6...15.8

100 s: (15.3...16.0)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 300.02nd speed Rack travel in mm: 8.0...8.2 Del.quantity cm3/ : 2.5...3.0

100 s: (2.3...3.3)

cm3 : 0.4Spread

100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 600

Speed Rack travel in mm : 15.20...16.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600 Aneroid pressure h: 1000

: 156.0...158.0 Del.quantity 1000 : (153.5...160.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Setting point:

rom Rack travel in mm : 15.8

Testina:

1st rack travel in: 12.40 Speed rpm : 1030...1045

2nd rack travel in: 4.00

rpm : 1090...1120 Speed 4th rack travel in: 1300 rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring Speed rom : 300 Rack travel in mm: 8.1 Testing: Speed : 100 rpm Minimum rack trave: 10.70 : 300 rpm Speed Rack travel in mm : 8.00...8.20 Rack travel in mm : 2.00 : 360...400 Speed rpm TORQUE CONTROL Dimension a mm : 0.40 Torque control curve - 1st version st speed rpm : 980
Rack travel in m: 13.40...13.60 1st speed 2nd speed : 600 rpm Rack travel in m: 14.40...14.60 3rd speed rpm : 750 Rack travel in m: 14.00...14.10 : 825 4th speed rpm Rack travel in m: 13.60...13.80 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 14.20...14.30 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 12.70...12.90 2nd pressure hPa : 290 Rack travel in m: 13.80...13.90

3rd pressure hPa : 260

Rack travel in m: 13.20...13.40 FUEL DELIVERY CHARACTERISTICS 1st version

rpm : 600 Speed Del.quantity cm3/: 122.0...124.0 1000 s: (119.5...126.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.40 rpm : 1030...1045 Speed STARTING FUEL DELIVERY : 100 Speed rpm Del.quantity cm3/: 280.0...320.0 1000 s: (276.0...324.0) Rack travel in mm : 19.50...21.00 LOW IDLE Speed rpm: 300
Rack travel in mm: 8.00...8.20
Del.quantity cm3/: 25.5...30.5 1000 s: (23.0...33.0) Spread cm3 : 4.50 1000 s: (7.50) Remarks: Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

M<sub>2</sub>5

Speed

Aneroid pressure h: 1000

Aneroid pressure h: -

rpm

: 980

Del.quantity cm3/: 136.0...138.0 1000 s: (132.0...142.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: VOL 10.0 o6 Test sheet : 02.08.91 Edition Replaces : 24.10.90

Test oil : ISO-4113

: 0 401 846 745 Combination no.

Injection pump

Pump designation : PE6P110A320RS3080 EP type number : 0 411 816 722

Governor

Governor design. : RQV250...1100PA919

: 0 421 813 776 Governer no.

Customer-spec. information : VOLVO Customer

: TD 100 G Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...174

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x-600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 3.50...3.60 Prestroke mm

: (3.45...3.65)

Rack travel in mm : 9.00...12.00 : 1-5-3-6-Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 16.7...16.9

100 s: (16.4...17.2)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 250.0 2nd speed Rack travel in mm : 3.9...4.1 Del.quantity cm3/ : 1.5...1.9

100 s: (1.2...2.1)

cm3 : 0.3Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250 travel mm : 1.10...1.30

2nd speed rpm : 500 travel mm : 4.10...4.90

3rd speed : 700 rpm

6.30...6.70 travel mm 950 4th speed rpm

6.30...6.70 1100 travel mm

5th speed rpm

: 7.00...7.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1175 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 900

Del.quantity : 107.0...172.0)

: 4.00 Spread cm3 1000 : (7.50)

RATED SPEED

1st version Control lever

position degrees: 115...123

Testing:

1st rack travel in: 11.30

Speed rpm : 1160...1170

2nd rack travel in: 4.00

Speed rpm : 1220...1250 4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control Lever

position degrees: 60...68

Testing:

Speed rpm : 100

Minimum rack trave: 5.30 Speed rpm : 250 Rack travel in mm : 3.90...4.10

CONSTANT REGULATION

rpm : 270...380 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed man hPa : 900 Pressure

Rack travel mm : 12.30...12.40

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.00

2nd pressure hPa : 610 Rack travel in m: 12.10...12.20

3rd pressure hPa : 280

Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 700 Speed

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.30

rpm : 1160...1170 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 160.0...190.0 1000 s: (156.0...196.0) Rack travel in mm: 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 3.90...4.10

Del.quantity cm3/: 15.0...19.0 1000 s: (12.5...21.5) Spread cm3 : 3.00 1000 s: (6.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Prestroke mm : 3.60...3.70 : (3.55...3.75)
Rack travel in mm : 9.00...12.00 BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Firing order : 1-5-3-6-2-4 Test sheet : VOL 12,2 h : 28.06.91 Edition Replaces : 28.3.91 : ISO-4113 Test oil Phasing : 0-60-120-180-240-300 : 0 401 846 826 Tolerance + - ° : 0.50 (0.75) Combination no. Time to cyl. no. : 1 Injection pump Pump designation : PE6P120A320RS3178 : 0 411 826 752 EP type number BASIC SETTING Governor Governor design. : RQV250...1025PA921-2 rpm: 700 1st speed : 0 421 813 785 Governer no. Rack travel in mm : 14.00...14.10 Customer-spec. information Del.quantity cm3/: 25.3...25.5 : VOLVO Customer : TD122FS 100 s: (25.0...25.8) Engine : 287.0 cm3 : 0.51st version kW Spread : 2050 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0Test oil Rack travel in mm: 4.8...5.1 inlet temp. °C : 38...42 Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5) cm3 : 0.5Overflow valve Spread 100 s: (0.7) : 1 457 413 010 Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 019 GUIDE SLEEVE TRAVEL assembly rpm : 250 1st speed : 1.00...1.40 Openina . travel mm : 207...210 : 450 pressure, bar 2nd speed rpm 3.60...4.20 travel mm 3rd speed : 800 Orifice plate rpm : 6.30...6.70 : 1070 diameter mm : 0,8 travel mm 4th speed rpm : 8.00...8.20 travel mm Test Lines : 1 680 750 067 : 1180 5th speed rpm : 9.90...10.30 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 6.00x1.50x1000 Control-lever position Degree: -1 Speed rpm : 1130 Rack travel in mm : 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 Speed rpm : 700

Aneroid pressure h: 1200

: 253.0...255.0 1000 : (250.0...258.0) Del.quantity

5.00 Spread cm31000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 13.00 rpm : 1055...1065 Speed

2nd rack travel in: 4.00

rpm : 1140...1170 Speed

4th rack travel in: 1250

rpm : 0.00...1.ປີບັ Speed

LOW IDLE 1 Control Lever

position degrees: 59...67

Testing:

Speed : 100 rpm Minimum rack trave: 6.40 : 250 Speed rpm

Rack travel in mm : 4.80...5.10

CONSTANT REGULATION

rpm : 250...400 Speed

Aneroid/Altitude Compensator Test

1st version Settina

Speed : 500 rpm hPa : 1200 Pressure

Rack travel mm : 14.00...14.าบ

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.30...10.50 2nd pressure hPa : 90 Rack travel in m: 10.50...10.60

3rd pressure hPa : 760

Rack travel in m: 13.50...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 163.0...165.0

1000 s: (160.0...168.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 13.00

rpm : 1055...1065 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 270.0...310.0 1000 s: (266.0...314.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.80...5.10 Del.quantity cm3/: 17.5...22.5 1000 s: (15.0...25.0)

cm3 : 5.00Spread

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Start-of-delivery setting with ROBO diaphragm.

N01

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Note remarks : VOL 12,2 h2 Test sheet Edition : 05.07.91 Replaces : 15.3.90 Test oil : ISO-4113 Combination no. : 0 401 846 827 Injection pump Pump designation : PE6P120A320RS3178 : 0 411 826 752 EP type number Governor Governor design. : RQV250...950PA921-3 : 0 421 813 786 Governer no. Customer-spec. information Customer : VOLVO : TD122F Engine : 257.0 1st version kW : 1900 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly **Opening** : 207...210 pressure, bar Orifice plate diameter mm : 0,8 : 1 680 750 067 Test lines Outside diameter x Wall thickness : 6.00x1.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 3.60...3.70 : (3.55...3.75) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING rpm: 700 1st speed Rack travel in mm : 13.00...13.10 Del.guantity cm3/: 22.9...23.1 100 s: (22.6...23.4) cm3 : 0.5Spread 100 s: (0.9) rpm : 250.0 2nd speed Rack travel in mm: 4.6...4.8 Del.quantity cm3/: 1.7...2.2 100 s: (1.4...2.5) cm3 : 0.5 Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 : 1.00...1.40 travel mm : 450 2nd speed rom : 3.60...4.20 : 700 travel mm 3rd speed rpm travel mm : 6.30...6.70 : 985 4th speed rpm : 8.10...8.30 travel mm rpm : 1060 5th speed : 9.40...9.80 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1030 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Speed Aneroid pressure h: 900

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 229.0...231.0 1000 : (226.0...234.0)

Spread cm3 : 5.00 1000 : (9.00)

## RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 12.00 Speed rpm : 980...990 2nd rack travel in: 4.00

Speed rpm : 1060...1090

4th rack travel in: 1200

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 60...68

Testing:

Speed rpm : 100 Minimum rack trave: 6.20 Speed rpm : 250

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

Speed rpm : 250...380

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm: 500 Pressure hPa: 900

Rack travel mm : 13.00...13.10

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 10.00...10.20 2nd pressure hPa : 90

Rack travel in m: 10.20...10.30

3rd pressure hPa : 600

Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 700

Del.quantity cm3/: 163.0...165.0

1000 s: (160.0...168.0)

N<sub>0</sub>3

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.00 Speed rpm : 980...990

STARTING FUEL DELIVERY

Speed rpm: 100

Del.quantity cm3/: 270.0...310.0 1000 s: (266.0...314.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.60...4.80 Del.quantity cm3/ : 17.5...22.5 1000 s: (14.5...25.5)

Spread cm3 : 5.00

1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90

mr

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 p 4 : 26.07.91 Edition : 9.11.89 Replaces Test oil : ISO-4113

Combination no. : 0 401 846 898

Injection pump

Pump designation : PE6P110A720RS3225 : 0 411 816 763 EP type number

Governor

Governor design. : RQV275...1200PA910

: 0 421 813 746 Governer no.

Customer-spec. information : DAF Customer

: HS 200 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Openina

: 172...175 pressure, bar

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mn

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300

: 0.50 (0.75) Tolerance + - °

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 12.4...12.6

100 s: (12.1...12.8)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 275.0
Rack travel in mm : 7.2...7.4
Del.quantity cm3/ : 1.4...1.9
100 s: (1.1...2.1)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed : 1.00...1.40 travel mm

2nd speed : 450 rpm

: 2.90...3.30 travel mm

: 800 3rd speed rpm

: 4.70...5.10 travel mm

4th speed rpm : 1200

: 7.80...8.00 travel mm

1500 5th speed rpm

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1235 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000Aneroid pressure h: 1000

: 124.0...126.0 Del.quantity 1000 : (121.5...128.5)

Spread cm3 : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever position degrees: 116...124 Testina: 1st rack travel in: 11.50 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 Speed rpm : 1345...1375 4th rack travel in: 1450 Speed rpm : 0.00...1.40LOW IDLE 1 Control lever position degrees: 78...86 Testing: Speed : 100 rpm Minimum rack trave: 6.70 Speed rpm : 275 Rack travel in mm : 4.70...4.90 CONSTANT REGULATION rpm : 280...400 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed man : 600 Pressure hPa : 1000 : 12.50...12.60 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 10.90...11.00 2nd pressure hPa : 360
Rack travel in m: 12.10...12.20
3rd pressure hPa : 270
Rack travel in m: 11.40...11.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 87.0...89.0 1000 s: (84.5...91.5) **BREAKAWAY** 1st version 1mm rack travel less than

Speed rpm : 1240...1250

Speed rpm : 275 Rack travel in mm : 4.70...4.90

Remarks:

:

N<sub>0</sub>5

full load rack tr: 11.50

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 12,2 d1 : 05.07.91 : 22.3.91 Test sheet Edition Replaces Test oil : ISO-4113 : 0 401 846 901 Combination no. Injection pump Pump designation : PE6P12OA32ORS3240-1 : 0 411 826 787 EP type number Governor Covernor design. : RQV250...950PA921-17 : 0 421 813 800 Governer no. Customer-spec. information Customer : VOLVO-TRUCK : TD122FH Engine 1st version kW : 269.0 : 1900 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 457 413 010 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening 1 : 207...210 pressure, bar Orifice plate diameter mm : 0,8 : 1 680 750 067 Test lines Outside diameter x Wall thickness x Length mm : 6.00X1.50X1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 2.80...2.90 Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : 0-60-120-180-240-300 Phasina Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 700 Rack travel in mm : 12.70...12.80 Del.guantity cm3/: 22.3...22.5 100 s: (22.0...22.8) Spread cm3 : 0.5100 s: (0.9) rpm : 250.0 2nd speed Rack travel in mm : 6.5...6.7 Del.quantity cm3/ : 1.7...2.2 100 s: (1.5...2.5) cm3 : 0.5Spread 100 s: (0.7) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 : 1.00...1.40 travel mm rpm : 450 2nd speed travel mm : 3.60...4.20 3rd speed : 700 rpm : 6.30...6.70 travel mm 4th speed : 985 rpm : 8.10...8.30 travel mm 5th speed : 1060 rom : 9.40...9.80 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1030 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 Aneroid pressure h: 900

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Del.quantity : 223.0...225.0 1000 : (220.0...228.0) cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 11.70 rpm : 990...1000 Speed 2nd rack travel in: 4.00

rpm : 1050...1080 Speed

4th rack travel in: 1200

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 60...68

Testina:

Speed rom Minimum rack trave: 8.10 Speed rpm : 250

Rack travel in mm : 6.50...6.70

CONSTANT REGULATION

rpm : 250...380 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm hPa : 900 Pressure

Rack travel mm : 12.70...12.80

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.60...9.80

2nd pressure hPa : 85

Rack travel in m: 9.80...9.90

3rd pressure hPa : 470

Rack travel in m: 12.10...12.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 154.0...156.0 1000 s: (151.0...159.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 11.70

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 270.0...310.0 1000 s: (266.0...314.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.50...6.70 Del.quantity cm3/: 17.5...22.5

1000 s: (15.0...25.0)

cm3 : 5.00 1000 s: (7.00) Spread

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Start-of-delivery setting with ROBO

diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4 Note remarks Firing order : VOL 10,2 a : 26.07.91 Test sheet Edition : 19.10.90 Replaces : 0-60-120-180-240-300 : ISO-4113 Phasina Test oil Combination no. : 0 401 846 935 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 Injection pump Pump designation : PE6P12OA32ORS3262 : 0 411 826 797 BASIC SETTING EP type number Governor Governor design. : RQV300...1050PA232-4 1st speed rpm: 700 : 0 421 813 883 Governer no. Rack travel in mm : 9.20...9.30 Customer-spec. information Del.quantity cm3/: 16.9...17.1 Customer : VME : TD102 GC 100 s: (16.6...17.4) Engine 1st version kW : 180.0 Spread cm3 : 0.5Rated speed : 2100 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 3.2...3.7 Test oil inlet temp. °C : 38...42 100 s: (2.9...3.9) cm3 : 0.5Overflow valve Spread 100 s: (0.7) : 1 417 413 025 (B) Setting of injection pump Inlet press., bar: 1.50 with governor Test nozzle holder : 1 688 901 019 GUIDE SLEEVE TRAVEL assembly rpm : 300 1st speed : 1.30...1.70 Opening 1 travel mm : 500 : 207...210 2nd speed pressure, bar rpm : 2.70...3.30 travel mm 3rd speed : 800 Orifice plate rpm : 4.90...5.50 diameter mm : 0,8 travel mm rpm : 1100 4th speed : 7.60...7.70 travel mm Test lines : 1 680 750 067 5th speed rpm : 1180 travel mm : 8.80...9.20 Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00x1.50x1000 x Length mm Control-lever position Degree: -1 rpm : 1150 (A) Injection pump setting values Speed Insp. values in parer theses Rack travel in mm : 15.20...17.80 Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values \_\_\_\_ BEGINNING OF DELIVERY 1st version rpm : 700 Test pressure, bar: 25...27 Speed

Aneroid pressure h: 900

: 169.0...171.0 Del.quantity 1000 : (166.0...174.0) : 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 108...116

Testing:

1st rack travel in: 8.20 rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1150...1180 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 80...88

Testing:

Speed : 100 rom Minimum rack trave: 6.90 rpm

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 300...410 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm hPa : 900 Pressure

: 9.20...9.30 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 8.90...9.10

2nd pressure hPa : 160

Rack travel in m: 9.10...9.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 700 Speed

Del.quantity cm3/: 164.0...166.0

1000 s: (161.0...169.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 8.20

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 5.30...5.50 Del.quantity cm3/: 32.0...37.0 1000 s: (29.5...39.5)

cm3 : 5.00 1000 s: (7.00) Spread

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

APPLICATION

Loading machine

: 2.40...2.50 : (2.30...2.50) BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm Rack travel in mm : 9.00...12.00 Note remarks Firing order : 1-5-3-6-2-4 Test sheet : VOL 5,9 a : 26.07.91 Edition Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 401 846 937 Tolerance + - ° : 0.30 (0.75) Time to cyl. no. : 1 Injection pump Pump designation : PE6P110A320RS3266 EP type number : 0 412 816 777 BASIC SETTING Governor Governor design. : RQV300...1300PA966K 1st speed rpm: 780 : 0 421 815 277 Governer no. Rack travel in mm : 12.00...12.10 Customer-spec. information : VOLVO-TRUCK Del.guantity cm3/: 13.1...13.3 Customer 100 s: (12.8...13.6) : TD63ES Engine : 155.0 cm3 : 0.51st version kW Spread : 2600 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 330.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 1.7...2.1 Test oil inlet temp. °C : 38...42 100 s: (1.4...2.4) Overflow valve cm3 : 0.7Spread : 1 457 413 010 100 s: (1.1) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 101 GUIDE SLEEVE TRAVEL 1st speed rpm : 330 : 1.80...2.20 **Opening** travel mm rpm : 500 pressure, bar : 207...210 2nd speed : 3.20...3.80 travel mm : 850 Orifice plate 3rd speed rpm diameter mm : 4.60...5.20 : 0,6 travel mm rpm : 1250 4th speed 7.90...8.10 travel mm rpm : 1350 : 1 680 750 008 Test lines 5th speed : 9.30...9.70 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X2.00X600 x Length mm Control-lever position Degree: -1 rpm : 1420 (A) Injection pump setting values Speed Insp. values in parentheses Rack travel in mm : 15.20...17.80 Set equal delivery quant. FULL LOAD DELIV. AT FULL LOAD STOP per values \_\_\_\_ BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 rpm : 780 Speed

Aneroid pressure h: 900

Del.quantity : 131.0...136.0)

cm3 : 5.00 Spread 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 114...122

Testing:

1st rack travel in: 11.40

Speed rpm : 1360...1370

2nd rack travel in: 4.00

rpm : 1430...1460

4th rack travel in: 1450

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 72...80

Testing:

Speed : 100 rpm Minimum rack trave: 6.90 : 330 rpm

Rack travel in mm : 5.30...5.50

CONSTANT REGULATION

rpm : 330...600 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

rpm : 1300 1st speed

Rack travel in m: 12.40...12.50 d speed rpm : 780

2nd speed

Rack travel in m: 12.00...12.10

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 1300 rom hPa : 900 Pressure

: 12.40...12.50 Rack travel mm

Measurement

 $1/\min : 1300$ Speed

1st pressure hPa : -

Rack travel in m: 9.00...9.20

2nd pressure hPa : 110

Rack travel in m: 9.20......30

3rd pressure hPa : 725

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 : 1300 Speed rpm

Del.quantity cm3/: 128.0...134.0 1000 s: (126.0...136.0) Spread cm3: 8.00

1000 s: (12.0)

Aneroid pressure h: -

, : 780 Speed rpm

Del.quantity cm3/: 73.0...75.0 1000 s: (70.0...78.0)

**BREAKAWAY** 

1st version

1mm rack travel less than

full load rack tr: 11.40

rpm : 1360...1370 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.guantity cm3/: 100.0...130.0

1000 s: (96.0...134.0)

Rack travel in mm : 10.00...10.50

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Start-of-delivery setting with ROBO

diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : VOL 5,9 a 1 Test sheet : 02.08.91 Edition Replaces Test oil : ISO-4113 : 0 401 846 938 Combination no. Injection pump Pump designation : PE6P110A320RS3266 EP type number : 0 412 816 777 Governor : RQV300...1300PA966-1 Governor design. : 0 421 815 278 Governer no. Customer-spec. information Customer : VOLVO-TRUCK : TD63E Engine : 133.0 1st version kW : 2600 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 457 413 010 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 101 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,6 : 1 680 750 008 Test lines

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Prestroke mm : 2.40...2.50 : (2.30...2.50) Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.30 (0.75) Time to cyl. no. BASIC SETTING rpm: 780 1st speed Rack travel in mm : 10.00...10.10 Del.quantity cm3/: 9.7...9.9 100 s: (9.4...10.2) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 330.0 Rack travel in mm : 5.0...5.2 Del.quantity cm3/ : 1.7...2.1 100 s: (1.4...2.4) cm3 : 0.7Spread 100 s: (1.1) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 330 : 1.80...2.20 travel mm rpm : 500 : 3.20...3.80 2nd speed travel mm 3rd speed rpm : 850 travel mm : 4.60...5.20 4th speed rpm : 1250 : 7.90...8.10 travel mm rpm : 1350 5th speed : 9.30...9.70 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1420 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 780

Outside diameter x Wall thickness

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

x Lenath mm

Aneroiu D. ... Del.quantity 1000 Aneroid pressure h: 900 3rd pressure hPa : 480 : 97.0...99.0 Rack travel in m: 10.40...10.60 : (94.0...102.0) cm3 : 5.00 FUEL DELIVERY CHARACTERISTICS Spread 1000 : (9.00) RATED SPEED 1st version Aneroid pressure h: 900 1st version rpm : 1300 Speed Del.quantity cm3/: 115.0...121.0 1000 s: (113.0...123.0) Spread cm3 : 8.00 1000 s: (12.) Control lever position degrees: 114...122 Testing: 1st rack travel in: 10.00 Aneroid pressure h: 900 rpm : 1360...1370 : 1050 Speed Speed rpm Del.quantity cm3/: 109.0...115.0 2nd rack travel in: 4.00 1000 s: (106.0...118.0) rpm : 1420...1450 Speed 4th rack travel in: 1550 Aneroid pressure h: -Speed rpm : 780
Del.quantity cm3/: 73.0...75.0
1000 s: (70.0...78.0) rpm : 0.00...1.00Speed LOW IDLE 1 Control Lever position degrees: 72...80 **BREAKAWAY** Testing: Speed : 100 1st version rpm Minimum rack trave: 6.60 1mm rack travel less than rpm : 330 Rack travel in mm : 5.00...5.20 full load rack tr: 10.00 rpm : 1360...1370 Speed CONSTANT REGULATION rpm : 330...600 Speed STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm :? rpm : 100 Speed Del.quantity cm3/: 95.0...125.0 1000 s: (91.0...129.0) Torque control curve - 1st version rpm : 1300 1st speed Rack travel in mm : 9.60...10.10 Rack travel in m: 11.00...11.10 2nd speed rpm : 780 -Rack travel in m: 10.00...10.10 3rd speed rpm : 1050 Rack travel in m: 10.50...10.70 LOW IDLE Speed rpm: 330
Rack travel in mm: 5.00...5.20
Del.quantity cm3/: 17.0...21.0 Aneroid/Altitude 1000 s: (14.0...24.0) Compensator Test cm3 : 7.00Spread 1000 s: (11.00) 1st version Setting Remarks: : 1300 Speed man hPa : 900 Pressure : 11.00...11.10 Delivery-valve spring pre-tension = 2.40...2.60 mm. Rack travel mm Permissible alteration from 2.20...2.90 Measurement Speed 1/min: 1300 1st pressure hPa : -Start-of-delivery setting with ROBO Rack travel in m: 8.50...8.70 diaphragm. 2nd pressure hPa : 110 Rack travel in m: 8.70...8.80

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MB 11,0 x 2 Test sheet : 28.06.91 Edition

Replaces

: ISO-4113 Test oil

: 0 401 846 946 Combination no.

Injection pump

Pump designation : PE6P110A320LS3851-1

: 0 411 818 780 EP type number

Governor

Governor design. : RQ300/1050PA1007-1

Governer no. : 0 421 801 589

Customer-spec. information

Customer : MERCEDES-BENZ

: OM442 Engine

: 151.0 1st version kW : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 101 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

: 1 680 750 008 Test lines

Outside diameter

x Wall thickness

x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values \_\_\_\_

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.40...4.50 Prestroke mm

: (4.35...4.55) Rack travel in mm : 9.00...12.00

Firina order

: 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 11.8...12.0

100 s: (11.5...12.2)

Spread cm3 : 0.8

100 s: (1.3)

rpm : 300.02nd speed

Rack travel in mm: 6.5...7.1

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.4)

cm3 : 0.6Spread

100 s: (1.1)

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 650

Rack travel in mm : 13.10...13.90

FULL LOAD DELIV. AT FULL & OAD STOP

1st version

rpm : 1593 Speed

: 158.0...120.0 Del.quantity 1000 : (115.5...122.5)

: 8.50

Spread cm3

1000 : (13.00)

RATED SPEED

1st version

Setting point:

Speed Rack travel in mm: 13.5

Testing: 1st rack travel in: 10.10 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 Speed rpm : 1170...1200 4th rack travel in: 1300 rpm : 0.00...2.00Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 6.8 Testing: Speed : 200 rpm Minimum rack trave: 8.40 : 300 Speed rpm Rack travel in mm : 6.50...7.10 Rack travel in mm : 2.00 : 390...430 Speed rpm FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity cm3/: 117.0...123.0 1000 s: (114.5...125.5) cm3 : 11.00 Spread 1000 s: (14.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.10 : 1090...1100 Speed rom STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0 1000 s: (126.0...154.0) Remarks: :

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: VOL 12,2 d2 : 26.07.91 Test sheet Edition

Replaces

Test oil : ISO-4113

: 0 401 846 949 Combination no.

Injection pump

Pump designation : PE6P120A320RS3240 : 0 411 826 786

EP type number

Governor

Governor design. : RQV250...1025PA921

-22

: 0 421 813 942 Governer no.

Customer-spec. information

Customer : VOLVO-TRUCK

: TD122FA Engine

1st version kW : 291.0 : 2050 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 25.1...25.3

100 s: (24.8...25.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm : 6.5...6.7

Del.quantity cm3/: 1.7...2.2 100 s: (1.5...2.5)

cm3 : 0.5Spread 100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.00...1.40 travel mm

rpm : 450 2nd speed

: 3.60...4.20 travel mm

3rd speed : 800 rpm

: 6.30...6.70 travel mm

: 1070 4th speed rpm : 8.00...8.20

travel mm rpm : 1180 5th speed

: 9.90...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1130

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

N16

Aneroid pressure h: 1200 Del.quantity : 251.0...253.0 1000 : (248.0...256.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever

position degrees: 116...124

Testina:

1st rack travel in: 12.60

rpm : 1065...1075

2nd rack travel in: 4.00

rpm : 1140...1170 Speed

4th rack travel in: 1250

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 60...68

Testing:

Speed rpm Minimum rack trave: 8.10 rpm : 250

Rack travel in mm : 6.50...6.70

CONSTANT REGULATION

rpm : 250...380 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 man Pressure hPa : 1500

Rack travel mm : 13.60...13.70

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.10...9.30

2nd pressure hPa : 90

Rack travel in m: 9.30...9.40

3rd pressure hPa : 1000

Rack travel in m: 13.00...13.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 700 Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0)

**BREAKAWAY** 

1st version 1mm rack travel less than

full load rack tr: 12.60

rpm : 1065...1075 Speed

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 270.0...310.0 1000 s: (266.0...314.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 250
Rack travel in mm : 6.50...6.70
Del.quantity cm3/ : 17.5...22.5
1000 s: (15.0...25.0)

Spread

cm3 : 5.00 1000 s: (7.00)

Remarks:

Delivery-valve spring pre-tension = 2.40...2.60 mm.

Permissible alteration from 2.20...2.90

Start-of-delivery setting with ROBO

diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 8,3 p11 Test sheet : 26.07.91 Edition Replaces Test oil : ISO-4113 Combination no. : 0 401 846 953 Injection pump Pump designation : PE6P110A720RS3225Z EP type number : 0 411 816 782 Governor Governor design. : RQ275/1200PA913-1 : 0 421 801 549 Governer no. Customer-spec. information Customer : DAF Engine : HS 200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly **Opening** : 172...175 pressure, bar : 1 680 750 015 Test lines Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 3.70...3.80 : (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 12.70...12.80 Del.quantity cm3/: 12.9...13.1 100 s: (12.6...13.3) cm3 : 0.4Spread 100 s: (0.7) 2nd speed rpm : 275.0 Rack travel in mm : 7.2...7.4 Del.quantity cm3/: 1.4...1.9 100 s: (1.1...2.1) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -1
Speed rpm : 550
Rack travel in mm : 15.20...16.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1000 : 129.0...131.0 1000 : (126.5...133.5) Del.quantity : 4.00 Spread cm3 1000 : (7.50) RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm: 15.8 Testing: 1st rack travel in: 11.70 rpm : 1235...1250 Speed 2nd rack travel in: 4.00 rpm : 1320...1350 Speed 4th rack travel in: 1450 rpm : 0.00...1.40beed LOW IDLE 1 Setting point w/out bumper spring

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 25...27

rpm : 275 Speed Rack travel in mm: 4.8 Testing: Speed rpm : 100 Minimum rack trave: 6.70 Speed rpm : 275 Rack travel in mm : 4.70...4.90 Rack travel in mm: 2.00 : 340...380 Speed ron TORQUE CONTROL Dimension a mm Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.70...13.80 2nd speed rpm : 1200 Rack travel in m: 13.60...13.80 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 12.70...12.80 Rack travel mm Measurement 1/min : 600Speed 1st pressure hPa : -Rack travel in m: 10.90...11.10 2nd pressure hPa : 360 Rack travel in m: 12.10...12.20 3rd pressure hPa : 270 Rack travel in m: 11.40...11.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 87.0...89.0 1000 s: (84.5...91.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.70 rpm : 1235...1250 Speed LOW IDLE : 275 Speed rpm

N19

Rack travel in mm : 4.70...4.90 Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 8,3 p12 Edition : 26.07.91

Replaces

Test oil : ISO-4113

: 0 401 846 954 Combination no.

Injection pump

Pump designation : PE6P110A720RS32257

: 0 411 816 782 EP type number

Governor

Governor design. : RQV275...1200PA910

: 0 421 813 746 Governer no.

Customer-spec. information Customer : DAF

Engine : HS 200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

**Opening** 

: 172...175 pressure, bar

: 1 680 750 015 Test lines

Outside diameter x Wall thickness

: 6.00x1.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 3.70...3.80 Prestroke mm

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 12.9...13.1

100 s: (12.6...13.3)

cm3 : 0.4Spread

100 s: (0.7)

rpm : 275.0 2nd speed

Rack travel in mm : 7.2...7.4 Del.quantity cm3/: 1.4...1.9

100 s: (1.1...2.1)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 250 1st speed

: 1.00...1.40 travel mm

2nd speed : 450 rpm

: 2.90...3.30 travel mm

3rd speed : 800 rpm

: 4.70...5.10 travel mm

4th speed 1200 rpm

: 7.80...8.00 travel mm

: 1500 5th speed rpm

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1235 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

: 129.0...131.0 Del.quantity 1000 : (126.5...133.5)

: 4.00 Spread cm3

1000 : (7.50)

RATED SPEED

1st version

Control lever position degrees: 116...124 Testing: 1st rack travel in: 11.70 Speed rpm : 1240...1250 2nd rack travel in: 4.00 rpm : 1345...1375 Speed 4th rack travel in: 1450 Speed rpm : 0.00...1.40 LOW IDLE 1 Control lever position degrees: 78...86 Testing: Speed rpm : 100 Minimum rack trave: 6.70 Speed rpm : 275 Rack travel in mm : 4.70...4.90 CONSTANT REGULATION rpm : 280...400 Speed Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 1000 Pressure : 12.70...12.80 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 10.90...11.00 2nd pressure hPa : 360 Rack travel in m: 12.10...12.20 3rd pressure hPa : 270 Rack travel in m: 11.40...11.60 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 600 Speed Del.quantity cm3/: 87.0...89.0 1000 s: (84.5...91.5) **BREAKAWAY** 1st version 1mm rack travel less than

Speed rpm : 1240...1250
LOW IDLE

Speed rpm : 275
Rack travel in mm : 4.70...4.90

Remarks:

:

N21

full load rack tr: 11.70

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: KHD 12,8 c Test sheet : 26.07.91 Edition Replaces

: ISO-4113 Test oil

Combination no. : 0 401 848 820

Injection pump

Pump designation: PE8P120A920/5LS3281 : 0 411 828 724 EP type number

Governor

Governor design. : RQV300...1050PA1009

: 0 421 813 938 Governer no.

Customer-spec. information Customer : KHD

Engine : BF8L513LC

1st version kW : 243.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 3.10...3.20 : (3.05...3.25) Prestroke mm

Rack travel in mm : 15.00...19.00 : 1- 8- 7- 2- 6- 5-4- 3 Firing order

: 0-45-90-135-180-225-Phasing

270-315

: 0.50 (0.75) Tolerance + - °

Time to cyl. no. : 1

BASIC SETTING

rpm: 1050 1st speed

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 18.6...18.8

100 s: (18.3...19.1)

Spread cm3 : 0.6

100 s: (1.0)

rpm : 300.02nd speed Rack travel in mm: 5.9...6.1

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 : 2.40...2.80 1st speed

travel mm : 450 2nd speed rpm

: 3.40...4.00 travel mm

3rd speed : 725 rpm : 5.30...5.90 travel mm

: 1100 4th speed rpm

: 9.10...9.30 : 1175 travel mm

rpm 5th speed

: 10.00...10.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1070

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed

Aneroid pressure h: 750

Del.quantity : 180.0...191.0)

Spread

: 6.00 cm3

1000 : (10.00)

RATED SPEED

1st version

Control lever

position degrees: 119...127

Testing:

1st rack travel in: 11.70

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1165...1195 Speed

4th rack travel in: 1450

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 86...94

Testing:

Speed : 100 rpm

Minimum rack trave: 9.50 : 300 rpm

Rack travel in mm : 5.90...6.10

CONSTANT REGULATION

rpm : 210...260 Speed

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

rpm : 1050 1st speed

Rack travel in m: 12.70...12.80

2nd speed rpm : 650

Rack travel in m: 13.00...13.20 3rd speed rpm : 805

Rack travel in m: 12.70...12.90

Aneroid/Altitude

Compensator Test

1st version

Setting

rpm : 500 hPa : 750 Speed rpm

Pressure

: 12.90...13.10 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.30...11.50

2nd pressure hPa : 450

Rack travel in m: 12.40...12.50

START CUT-OUT

Speed

 $1/\min : 220 (240)$ 

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 750

Speed rpm : 650 Del.quantity cm3/ : 186.0...190.0 1000 s: (183.0...193.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 124.0...126.0 1000 s: (121.0...129.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 175.0...195.0 1000 s: (-)

Remarks:

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : DAF 11,6 o7 Test sheet : 26.07.91 Edition : 3.8.90 Replaces Test oil : ISO-4113 Combination no. : 0 401 876 295 Injection pump Pump designation : PE6P120A320RS415-1 EP type number : 0 411 826 123 Governor Governor design. : RSV250...1000P5A508-: 0 421 833 194 Governer no. Customer-spec. information Customer : DAF Engine : DKZ 1160 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly **Opening** : 207...210 pressure, bar Orifice plate : 0,8 diameter mm Test lines : 1 680 750 067 Outside diameter

: 6.00X1.50X1000

: 2.80...2.90

: (2.75...2.95)

: 0-60-120-180-240-300 Phasina Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm: 850 Rack travel in mm : 12.50...12.60 Del.quantity cm3/: 20.6...20.8 100 s: (20.3...21.1) Spread cm3 : 0.5100 s: (0.9) rpm : 250.0 2nd speed Rack travel in mm: 6.7...6.9 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) Spread cm3 : 0.8 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 4.75FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm: 850 Aneroid pressure h: 700 Speed Del.quantity
1000 : 206.0...208.0 : (203.0...211.0) : 5.00 cm3 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 45...53 Testing: 1st rack travel in: 11.50 rpm : 1035...1045 Speed 2nd rack travel in: 4.00 rpm : 1115...1145 Speed

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

x Wall thickness

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

x Length mm

3rd rack travel in: 4.00 Speed rpm: 1185...1215 4th rack travel in: 1350 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 19...27 Setting point w/out bumper spring : 250 Speed rpm Rack travel in mm: 6.0 Speed rpm : 250
Rack travel in mm : 6.40...6.60
Rack travel in mm : 2.00 Speed : 630...690 rpm TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 850 Rack travel in m: 13.50...13.60 2nd speed rpm : 400 Rack travel in m: 13.50...13.70 3rd speed rpm : 300 Rack travel in m: 13.80...14.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rpm hPa : 700 Pressure : 12.50...12.60 Rack travel mm Measurement  $1/\min : 600$ Speed 1st pressure hPa : -Rack travel in m: 10.20...10.50 2nd pressure hPa : 340 Rack travel in m: 11.80...11.90 3rd pressure hPa : 260 Rack travel in m: 10.60...11.00 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 140.0...142.0 1000 s: (137.0...145.0)

full load rack tr: 11.50 rpm : 1035...1045 Speed STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 305.0...345.0 1000 s: (301.0...349.0) Rack travel in mm : 19.50...21.00 LOW IDLE rpm : 250 Speed Rack travel in mm : 6.40...6.60 Remarks:

BREAKAWAY

1st version

1mm rack travel less than

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DAF 11,6012 Edition : 26.07.91

: 3.4.87 Replaces : ISO-4113 Test oil

Combination no. : 0 401 876 296

Injection pump

Pump designation : PE6P12OA32ORS415-1

EP type number : 0 411 826 123

Governor

Governor design. : RSV250...1100P5A508-

: D 421 833 195 Governer no.

Customer-spec. information Customer : DAF

: DKX 1160 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

: 6.00x1.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.80...2.90 Prestroke mm

: (2.75...2.95)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.30 (0.75)

BASIC SETTING

1st speed rpm: 850

Rack travel in mm : 11.60...11.70

Del.quantity cm3/: 18.7...18.9

100 s: (18.4...19.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0 Rack travel in mm: 6.7...6.9

Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3 rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 850 Speed Aneroid pressure h: 700

Del.quantity : 187.0...192.0)

: 5.00 Spread cm3

: (9.00) 1000

RATED SPEED

1st version

Control Lever

position degrees: 102...110

Testing:

1st rack travel in: 10.60

rpm : 1135...1145 Speed

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

N26

3rd rack travel in: 4.00 Speed rpm : 1270...1300 4th rack travel in: 1430 Speed rpm : 0.30...1.40

LOW IDLE 1
Control lever
position degrees: 68...76
Setting point w/out bumper spring
Speed rpm : 250
Rack travel in mm : 6.0
Speed rpm : 250

Rack travel in mm: 6.40...6.60 Rack travel in mm: 2.00 Speed rpm: 600...700

TORQUE CONTROL
Torque control curve - 1st version
1st speed rpm : 850
Rack travel in m: 12.60...12.80
2nd speed rpm : 400

Rack travel in m: 12.60...12.80 3rd speed rpm : 300

Rack travel in m: 12.90...13.40

Aneroid/Altitude Compensator Test

1st version Setting Speed rpm : 600 Pressure hPa : 700

Rack travel mm : 11.60...11.70

Measurement Speed 1/min: 600

1st pressure hPa : -Rack travel in m: 10.30...10.50 2nd pressure hPa : 300\_

Rack travel in m: 11.30...11.40 3rd pressure hPa : 255

Rack travel in m: 10.80...11.10

FUEL DELIVERY CHARACTERISTICS

1st version
Aneroid pressure h: Speed rpm : 600
Del.quantity cm3/: 140.0...142.0
1000 s: (137.0...145.0)

**BREAKAWAY** 

1st version 1mm rack travel less than full load rack tr: 10.60 Speed rpm : 1135...1145

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 290.0...330.0 1000 s: (286.0...334.0) Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 250 Rack travel in mm : 6.40...6.60

Remarks:

N27